Cisco UCS C220 M3 High-Density Rack Server (Large Form Factor Hard Disk Drive Model)

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PUBLICATION HISTORY

REV B.12 MARCH 22, 2013

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OVERVIEW

The Cisco® UCS C220 M3 rack server is designed for performance and density over a wide range of business workloads from web serving to distributed database.

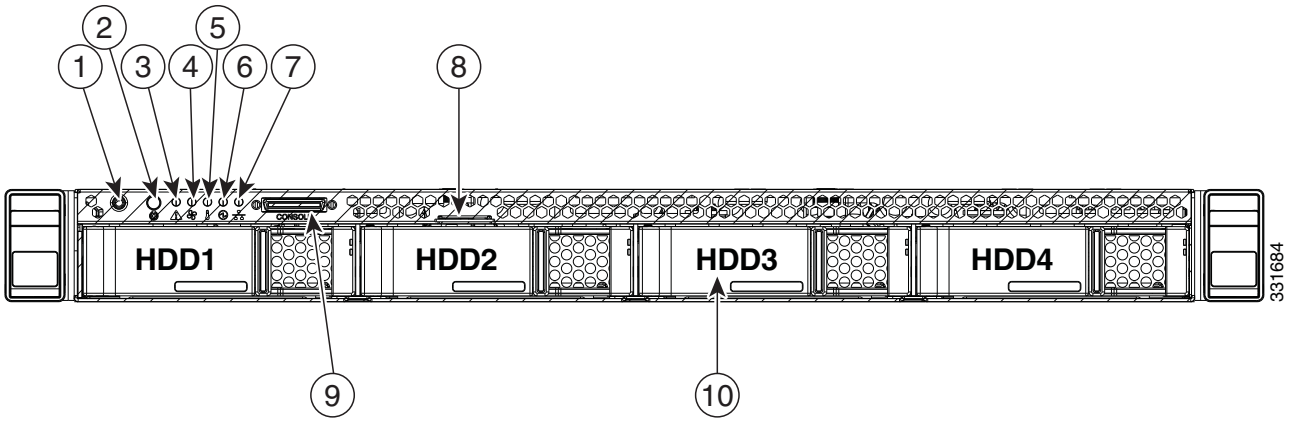
Building on the success of the Cisco UCS C200 M2 rack server, the enterprise-class UCS C220 M3 server further extends the capabilities of Cisco's Unified Computing System portfolio in a 1U form factor with the addition of the Intel® E5-2600 series product family CPUs that deliver significant performance and efficiency gains. In addition, the UCS C220 M3 server provides 16 DIMM slots, four 3.5-inch drives and 2 x 1 GbE LOM ports delivering outstanding levels of density and performance in a compact 1U package.

DETAILED VIEWS

Chassis Front View

Figure 1 shows the Cisco UCS C220 M3 High-Density LFF Rack Server.

Figure 1 Chassis Front View



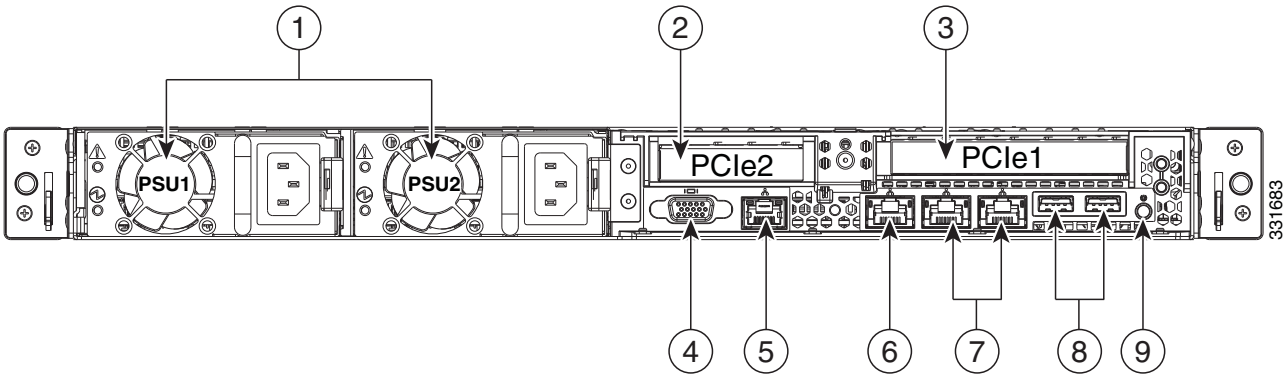
1	Power button/power status LED	**6**	Power supply status LED
2	Identification button/LED	**7**	Network link activity LED
3	System status LED	**8**	Asset tag (serial number)
4	Fan status LED	**9**	KVM connector (used with KVM cable that provides two USB, one VGA, and one serial connector)
5	Temperature status LED	**10**	Drives (up to four hot-swappable 3.5-inch drives)

For more information about the KVM cable connection, see *KVM CABLE, page 64*.

Chassis Rear View

Figure 2 shows the external features of the rear panel.

Figure 2 Chassis Rear View



1	Power supplies (up to two)	**6**	One 10/100/1000 Ethernet dedicated management port
2	Slot 2: Low-profile PCIe slot on riser: (half-height, half-length, x16 connector, x8 lane width)	**7**	Dual 1-Gb Ethernet ports (LAN1 and LAN2)
3	Slot 1: Standard-profile PCIe slot on riser: (full-height, half-length, x24 connector, x16 lane width)	**8**	USB ports
4	VGA video connector	**9**	Rear Identification button/LED
5	Serial port (RJ-45 connector)	**—**	—

BASE SERVER STANDARD CAPABILITIES and FEATURES

Table 1 lists the capabilities and features of the base server. Details about how to configure the server for a particular feature or capability (for example, number of processors, disk drives, or amount of memory) are provided in *CONFIGURING the SERVER, page 8*.

Table 1 Capabilities and Features

Capability/Feature	Description
Chassis	One rack unit (1RU) chassis
CPU	One or two Intel® E5-2600 series processor family CPUs
Chipset	Intel® C600 series chipset
Memory	16 slots for registered or unbuffered ECC DIMMs (RDIMMs or UDIMMs) or load-reduced DIMMs (LRDIMMs)
NIC	Embedded dual-port Intel i350 PCIe-based Gigabit Ethernet controller, supporting the following: ■ Pre-Execution Boot (PXE boot) ■ iSCSI boot
Expansion slots	Two PCIe slots (on a riser card) ■ One full-height profile, half-length slot with x24 connector and x16 lane ■ One half-height profile, half-length slot with x16 connector and x8 lane
Internal storage devices	Drives are installed into front-panel drive bays that provide hot-pluggable access. ■ Large Form Factor (LFF) drives. Up to four 3.5-inch SAS or SATA hot-swappable hard disk drives (HDDs). ■ The server also contains one internal USB 2.0 port on the motherboard that you can use with a USB thumb drive for additional storage.
Cisco Flexible Flash drives	The server supports one optional internal Cisco Flexible Flash drive (SD card). ■ The SD card is pre-loaded with four virtual drives. The four virtual drives contain, respectively, the Cisco Server Configuration Utility, the Cisco Host Upgrade Utility, the Cisco C-Series server drivers set, and a blank virtual drive on which you can install an OS or a hypervisor. ■ 4 GB is available for general use.
Video	The Emulex Pilot 3 Integrated Baseboard Management Controller provides video: ■ Matrox G200e video controller ■ Integrated 2D graphics core with hardware acceleration ■ Supports all display resolutions up to 1920 x 1200 x 16 bpp resolution at 60 Hz ■ 24-bit color depth for all resolutions less than 1600x1200 ■ 256 MB video memory

Capability/Feature	Description
Storage controllers	■ Embedded RAID (3 Gbs) • Embedded SATA-only RAID controller, supporting up to four SATA-only drives (RAID 0, 1, 10) • Intel Rapid Storage Technology Enterprise (RSTe) RAID upgrade, supporting up to four SAS+SATA drives (RAID 0, 1, 10). • LSI ROM1 RAID upgrade, supporting up to four SAS+SATA drives (RAID 0, 1, 10). • LSI ROM15 RAID upgrade, supporting up to four SAS+SATA drives (RAID 0, 1, 5, 10). ■ Mezzanine Cards (6 Gbs) - two versions • Cisco UCSC RAID SAS 2008M-8i Mezzanine Card supports up to eight SAS+SATA drives (limited to four drives for the C220 M3 LFF chassis) supporting RAID 0, 1, 5, 10, and 50. This card has a product ID (PID) of UCSC-RAID-11-C220. • Cisco UCSC RAID SAS 2008M-8i Mezzanine Card supports up to eight SAS+SATA drives (limited to four drives for the C220 M3 LFF chassis) supporting RAID 0, 1, and 10. This card has a product ID (PID) of UCSC-RAID-MZ-220. ■ Plug-in PCIe Cards (6 Gbs) • LSI MegaRAID SAS 9266CV-8i RAID 8-port PCIe plug-in RAID controller card with on-board 1 GB data cache and chassis-mounted (remote) supercap for data cache power backup, supporting RAID levels 0, 1, 5, 6, 10, 50, 60 and up to eight internal SAS+SATA drives (limited to four drives for the C220 M3 LFF chassis). • LSI MegaRAID SAS 9266-8i 8-port plug-in PCIe RAID RAID controller card with on-board 1 GB flash-backed write cache backup, supporting RAID levels 0, 1, 5, 6, 10, 50, 60 and up to 8 internal SAS+SATA drives (limited to four drives for the C220 M3 LFF chassis). • LSI MegaRAID 9285CV-8e PCIe plug-in RAID controller card with on-board 1 GB cache and chassis-mounted (remote) supercap for data cache power backup, supporting RAID levels 0, 1, 5, 6, 10, 50, 60. Supports 8 external SAS ports (up to 240 external drives).

Capability/Feature	Description
Interfaces	■ Rear panel • One RJ45 serial port connector • Two USB 2.0 port connectors • One DB15 VGA connector • Two RJ-45 10/100/1000 Ethernet port connectors • One RJ-45 10/100/1000 Ethernet management port, using Cisco Integrated Management Controller (CIMC) firmware ■ Various PCIe card ports (dependent on which cards are installed) • Converged Network Adapter (CNA) ports • Network Interface Card (NIC) ports • Host Bus Adapter (HBA) ports ■ Front panel • One KVM console connector (supplies two USB, one VGA, and one serial connector)
Front Panel	A front panel controller provides status indications and control buttons
Power subsystem	One or two 450 W or 650 W power supplies (no mixing). One is mandatory; one more can be added for 1 + 1 redundancy.
Fans	Chassis: ■ Five hot-swappable fans for front-to-rear cooling Power supply: ■ Each power supply is equipped with a fan.
Integrated management processor	Cisco Integrated Management Controller (CIMC) firmware. Depending on your CIMC settings, the CIMC can be accessed through the 1-Gb Ethernet dedicated management port, the 1-Gb Ethernet LOM ports, or a Cisco 1225 virtual interface card (VIC).

CONFIGURING the SERVER

Follow these steps to configure the Cisco UCS C220 M3 High-Density LFF Rack Server:

- *STEP 1 VERIFY SERVER SKU, page 9*
- *STEP 2 SELECT CPU(s), page 10*
- *STEP 3 SELECT MEMORY, page 12*
- *STEP 4 SELECT RAID CONFIGURATION, page 16*
- *STEP 5 SELECT HARD DISK DRIVES (HDDs), page 22*
- *STEP 6 SELECT PCIe OPTION CARD(s), page 24*
- *STEP 7 ORDER OPTIONAL NETWORK CARD ACCESSORIES, page 26*
- *STEP 8 ORDER POWER SUPPLY, page 29*
- *STEP 9 SELECT AC POWER CORD(s), page 30*
- *STEP 10 ORDER OPTIONAL REVERSIBLE CABLE MANAGEMENT ARM, page 33*
- *STEP 11 ORDER A TRUSTED PLATFORM MODULE (OPTIONAL), page 34*
- *STEP 12 ORDER CISCO FLEXIBLE FLASH SD CARD MODULE (OPTIONAL), page 35*
- *STEP 13 ORDER USB 2.0 DRIVE (OPTIONAL), page 36*
- *STEP 14 SELECT OPERATING SYSTEM, page 37*
- *STEP 15 SELECT OPERATING SYSTEM MEDIA KIT, page 39*
- *STEP 16 SELECT OPTIONAL VALUE-ADDED SOFTWARE, page 40*
- *STEP 17 SELECT SERVICE and SUPPORT LEVEL, page 41*
- *OPTIONAL STEP - ORDER RACK(s), page 46*
- *OPTIONAL STEP - ORDER PDU, page 47*

STEP 1 VERIFY SERVER SKU

Verify the product ID (PID) of the server as shown in *Table 2*.

Table 2 PID of the C220 M3 High-Density LFF Rack Base Server

Product ID (PID)	Description
UCSC-C220-M3L	UCS C220 M3 LFF, no CPU, memory, HDD, power supply, SD card, or PCIe cards, with rail kit

The Cisco C220 M3 server:

- Includes one tool-less rail kit
- Does not include power supply, CPU, memory, hard disk drives (HDDs), SD card, or plug-in PCIe cards.

NOTE: Use the steps on the following pages to configure the server with the components that you want to include.

STEP 2 SELECT CPU(s)

The standard CPU features are:

- Intel E5-2600 series processor family CPUs
- Intel C600 series chipset
- Cache size of 10, 15, or 20 MB

Select CPUs

The available CPUs are listed in *Table 3*.

Table 3 Available Intel CPUs: E5-2600 Series Processor Family CPUs

Product ID (PID)	Intel Number	Clock Freq (GHz)	Power (W)	Cache Size (MB)	Cores	QPI	Highest DDR3 DIMM Clock Support (MHz)[1]
UCS-CPU-E5-2690	E5-2690	2.90	135	20	8	8 GT/s	1600
UCS-CPU-E5-2680	E5-2680	2.70	130	20	8	8 GT/s	1600
UCS-CPU-E5-2670	E5-2670	2.60	115	20	8	8 GT/s	1600
UCS-CPU-E5-2667	E5-2667	2.90	130	15	6	8 GT/s	1600
UCS-CPU-E5-2665	E5-2665	2.40	115	20	8	8 GT/s	1600
UCS-CPU-E5-2660	E5-2660	2.20	95	20	8	8 GT/s	1600
UCS-CPU-E5-2650	E5-2650	2.00	95	20	8	8 GT/s	1600
UCS-CPU-E5-2650L	E5-2650L	1.80	70	20	8	8 GT/s	1600
UCS-CPU-E5-2643	E5-2643	3.30	130	10	4	8 GT/s	1600
UCS-CPU-E5-2640	E5-2640	2.50	95	15	6	7.2 GT/s	1333
UCS-CPU-E5-2630	E5-2630	2.30	95	15	6	7.2 GT/s	1333
UCS-CPU-E5-2630L	E5-2630L	2.00	60	15	6	7.2 GT/s	1333
UCS-CPU-E5-2620	E5-2620	2.00	95	15	6	7.2 GT/s	1333
UCS-CPU-E5-2609	E5-2609	2.40	80	10	4	6.4 GT/s	1066

Notes . . .

1. If higher or lower speed DIMMs are selected than what is shown in the table for a given CPU, the DIMMs will be clocked at the lowest common denominator of CPU clock and DIMM clock.

Approved Configurations

(1) 1-CPU configurations:

- Select any one CPU listed in *Table 3*.

(2) 2-CPU Configurations:

- Select two identical CPUs from any one of the rows of *Table 3 on page 10*.

Caveats

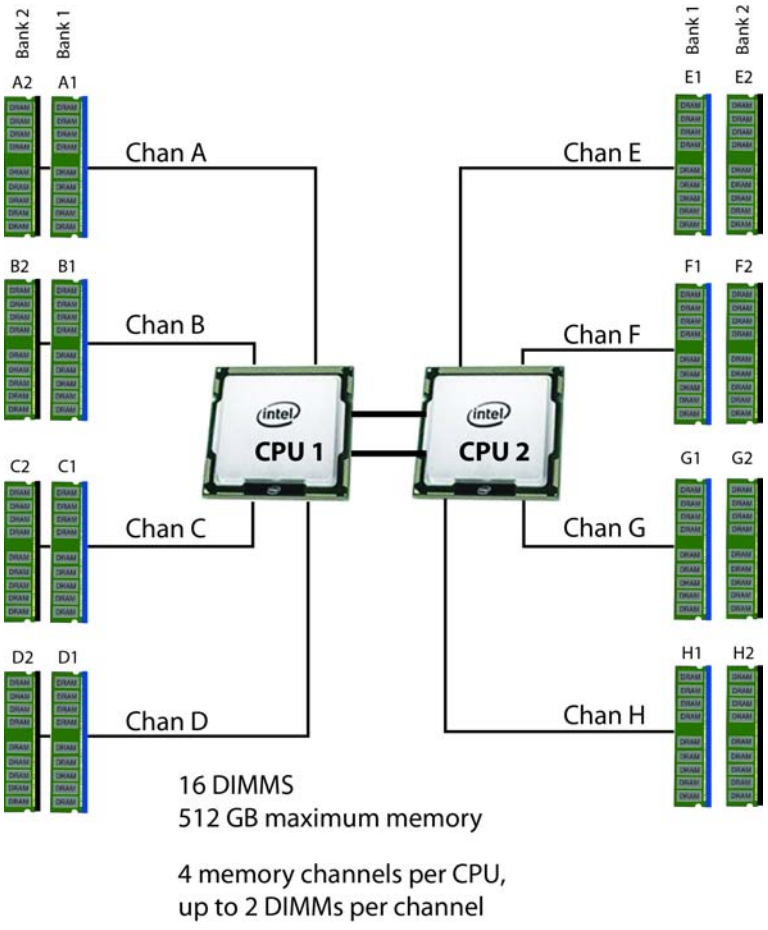
- You can select either one processor or two identical processors.
- For optimal performance, select DIMMs with the highest clock speed for a given processor (see *Table 3 on page 10*). If you select DIMMs whose speeds are lower or higher than that shown in the tables, suboptimal performance will result.

STEP 3 SELECT MEMORY

The standard memory features are:

- DIMMs
  - Clock speed: 1333 or 1600 MHz
  - Ranks per DIMM: 1, 2, or 4
  - Operational voltage: dual voltage capable (1.5 V or 1.35 V)
  - Registered or unbuffered ECC DDR3 DIMMs (RDIMMs or UDIMMs) or load-reduced DIMMs (LRDIMMs)
- Memory is organized with four memory channels per CPU, with up to two DIMMs per channel, as shown in *Figure 3*.

Figure 3 C220 M3 LFF Memory Organization



Select DIMMs and Memory Mirroring

Select the memory configuration and whether or not you want the memory mirroring option. The available memory DIMMs and mirroring option are listed in *Table 4*.

NOTE: When memory mirroring is enabled, the memory subsystem simultaneously writes identical data to two channels. If a memory read from one of the channels returns incorrect data due to an uncorrectable memory error, the system automatically retrieves the data from the other channel. A transient or soft error in one channel does not affect the mirrored data, and operation continues unless there is a simultaneous error in exactly the same location on a DIMM and its mirrored DIMM. Memory mirroring reduces the amount of memory available to the operating system by 50% because only one of the two populated channels provides data.

Table 4 Available DDR3 DIMMs

Product ID (PID)	PID Description	Voltage	Ranks/ DIMM
DIMM Options			
UCS-ML-1X324RY-A	32GB DDR3-1600-MHz LR DIMM/PC3-12800/quad rank/x4/1.35v	1.35 V	4
UCS-MR-1X162RY-A	16GB DDR3-1600-MHz RDIMM/PC3-12800/2R/x4/1.35v	1.35 V	2
UCS-MR-1X082RY-A	8GB DDR3-1600-MHz RDIMM/PC3-12800/2R/x4/1.35v	1.35 V	2
UCS-MR-1X082RX-A	8GB DDR3-1333-MHz RDIMM/PC3-10600/2R/x4/1.35v	1.35 V	2
UCS-MR-1X041RY-A	4GB DDR3-1600-MHz RDIMM/PC3-12800/single rank/x4/1.35v	1.35 V	1
UCS-MR-1X041RX-A	4GB DDR3-1333-MHz RDIMM/PC3-10600/single rank/x4/1.35v	1.35 V	1
UCS-MU-1X042RE-A	4GB DDR3-1600-MHz ECC UDIMM/PC3-12800/dual rank/x8/1.35v	1.35 V	2
Memory Mirroring Option			
N01-MMIRROR	Memory mirroring option		

Approved Configurations

(1) 1-CPU configuration without memory mirroring:

- Select from 1 to 8 DIMMs. Refer to *Memory Population Rules, page 51*, for more detailed information.

(2) 1-CPU configuration with memory mirroring:

- Select 2, 4, 6, or 8 identical DIMMs. The DIMMs will be placed by the factory as shown in the following table.

Total Number of DIMMs	CPU 1 DIMM Placement in Channels (for identical DIMMs)	
	Blue Slots	Black Slots
2	(A1, B1)	
4	(A1,B1); (C1,D1)	
6	(A1,B1); (C1,D1)	(A2,B2)
8	(A1,B1); (C1,D1)	(A2,B2); (C2,D2)

- Select the memory mirroring option (N01-MMIRROR) as shown in *Table 4 on page 13*.

(3) 2-CPU configuration without memory mirroring:

- Select from 1 to 8 DIMMs per CPU. Refer to *Memory Population Rules, page 51*, for more detailed information.

(4) 2-CPU configuration with memory mirroring:

- Select 2, 4, 6, or 8 identical DIMMs per CPU. The DIMMs will be placed by the factory as shown in the following table. Notice that DIMM placement is different for single-rank and dual-rank DIMMs.

Number of DIMMs per CPU	CPU 1 DIMM Placement in Channels (for identical DIMMs)		CPU 2 DIMM Placement in Channels (for identical DIMMs)	
	Blue Slots	Black Slots	Blue Slots	Black Slots
2	(A1, B1)		(E1, F1)	
4	(A1,B1); (C1,D1)		(E1,F1); (G1,H1)	
6	(A1,B1); (C1,D1)	(A2,B2)	(E1,F1); (G1,H1)	(E2,F2)
8	(A1,B1); (C1,D1)	(A2,B2); (C2,D2)	(E1,F1); (G1,H1)	(E2,F2); (G2,H2)

- Select the memory mirroring option (N01-MMIRROR) as shown in *Table 4 on page 13*.

NOTE: System performance is optimized when the DIMM type and quantity are equal for both CPUs, and when all channels are filled equally across the CPUs in the server.

Caveats

- For optimum performance, do not mix DIMMs with different frequencies. If you mix DIMM frequencies, the system defaults to the lower frequency.
- Do not mix RDIMMs and LRDIMMs
- DIMMs for CPU 1 and CPU 2 (when populated) must always be configured identically.
- The server supports 1 or 2 DIMMs per channel for single- or dual-rank RDIMMs.
- The server supports 1 or 2 DIMMs per channel for quad-rank LRDIMMs.
- The server supports registered DIMMs (RDIMMs) or load-reduced DIMMS (LRDIMMs), however, do not mix RDIMMs and LRDIMMs in a server.
- When using mirroring, DIMMs must be installed in identical pairs across paired DDR3 buses. That is, mirrored pairs in channels A and B must be identical and pairs in channels C and D must be identical. However, the DIMMs used in channels A and B and in C and D can be different.
- Non-ECC DIMMs are not supported.
- Memory mirroring reduces the amount of available memory by 50% (quantity of DIMMs must be even for mirroring).
- When single- and dual-rank DIMMs are populated for 2DPC, always populate the dual rank DIMM in the blue DIMM slot, and the single-rank DIMM in the black DIMM slot (only the 4GB DIMMs are single-rank).
- By default, all DIMMs run at 1.35 V, which yields 1333-MHz memory speeds. To run the memory DIMMS at 1600 MHz, you need to go into the BIOS or set the policy with UCSM (service profile) to run in Performance Mode. This forces the DIMMs to operate at 1.5 V and yields 1600-MHz speeds, provided:
  - The DIMMs are 1600-MHz devices and the DIMM type is RDIMM
  - The CPUs chosen support 1600-MHz operation.

NOTE: 32 GB LRDIMMs run at a maximum speed of 1333 MHz for 1DPC and 2DPC even though their specified maximum speed is 1600 MHz.

For more information regarding memory, see *CPUs and DIMMs, page 49*.

STEP 4 SELECT RAID CONFIGURATION

NOTE: If you do not select a mezzanine card, a plug-in PCIe RAID card, or one of the embedded RAID upgrade options, you will have an embedded SATA-only RAID controller that supports up to four SATA-only drives (RAID 0, 1, 10)

NOTE: When creating a RAID volume, follow these guidelines:

- Use the same capacity for each drive in the volume
- Use either all SAS drives or all SATA drives
- Use either all HDDs or all SSDs

NOTE: The number of RAID groups (virtual drives) supported per controller is as follows:

- Embedded RAID = 8
- LSI MegaRAID 9266CV-8i RAID controller card = 64
- LSI MegaRAID SAS 9266-8i RAID controller card = 64
- LSI MegaRAID 9285CV-8e RAID controller card = 64
- Cisco UCSC RAID SAS 2008M-8i Mezzanine Card = 16

The RAID controller choices are:

(1) Embedded RAID (on motherboard)

NOTE: The RAID configuration options listed in *Table 7 on page 18* are not available if you choose embedded RAID (in this case, you must configure RAID yourself using separate software).

(2) Mezzanine RAID controller cards (not supported in 1-CPU systems)

(3) Plug-in PCIe RAID controller cards

Cisco can provide factory-configured RAID systems depending on the RAID controller chosen and the number of drives ordered. Factory-configured RAID options are listed with each RAID card description.

Select RAID Options

Select as follows (these choices are dependent on the number of CPUs installed):

- One embedded RAID upgrade option, or
- One mezzanine RAID controller, or
- One mezzanine RAID controller and one external RAID controller, or
- One internal RAID controller, or
- One internal RAID controller and one external RAID controller

NOTE: For all valid combinations of embedded RAID, mezzanine RAID, and internal/external RAID controller combinations, see *RAID Summary, page 55*.

Table 5 Available Embedded RAID Options

Product ID (PID)	PID Description
RAID Controllers	
UCSC-SWRST	Onboard Intel RSTe RAID, supporting up to 4 SAS+SATA drives. SAS and SATA drives can be mixed. This option supports RAID 0, 1, and 10, and operates at 3 Gb/s. Operating system supported is Linux only (no VMware support).
UCSC-RAID-ROM1	Onboard LSI RAID, supporting up to 4 SAS+SATA drives. SAS and SATA drives can be mixed. This option supports RAID 0, 1, and 10, and operates at 3 Gb/s. Operating systems supported are Windows and Linux only (no VMware support).
UCSC-RAID-ROM15	Onboard LSI RAID, supporting up to 4 SAS+SATA drives. SAS and SATA drives can be mixed. This option supports RAID 0, 1, 5, and 10, and operates at 3 Gb/s. Operating systems supported are Windows and Linux only (no VMware support).

Table 6 Available Mezzanine Card RAID Options

Product ID (PID)	PID Description
Mezzanine RAID Controllers (not supported in 1-CPU systems)	
UCSC-RAID-11-C220	Cisco UCSC RAID SAS 2008M-8i Mezzanine Card (RAID 0, 1, 5, 10, and 50 supported), operating at 6 Gbs. ■ Supports up to eight internal SAS+SATA drives (limited to four drives for the C220 M3 LFF chassis). SAS and SATA drives can be mixed. ■ Factory-configured RAID options available: RAID 0, 1, 5, and 10 (see the RAID PIDs section in this table) ■ No data cache backup

Table 6 Available Mezzanine Card RAID Options *(continued)*

Product ID (PID)	PID Description
UCSC-RAID-MZ-220	Cisco UCSC RAID SAS 2008M-8i Mezzanine Card (RAID 0, 1, 10 supported), operating at 6 Gbs. ■ Supports up to eight internal SAS+SATA drives (limited to four drives for the C220 M3 LFF chassis). SAS and SATA drives can be mixed. ■ Factory-configured RAID options available: RAID 0, 1, and 10 (see the RAID PIDs section in this table) ■ No data cache backup

Table 7 Available Plug-In PCIe Card RAID Options

Product ID (PID)	PID Description
RAID Controllers **Note that plug-in PCIe RAID controllers are installed by default in slot 1 for 1-CPU systems and slot 2 for 2-CPU systems)**	
UCS-RAID-9266CV	LSI MegaRAID SAS 9266CV-8i RAID controller card with data cache backup (RAID 0, 1, 5, 6, 10, 50, 60), operating at 6 Gbs. ■ Supports up to eight internal SAS+SATA drives (limited to four drives for the C220 M3 LFF chassis). SAS and SATA drives can be mixed. ■ Includes a 1 GB Transportable Memory Module (TMM) and a chassis-mounted (remote) supercapacitor for data cache power backup ■ Factory-configured RAID options available: RAID 0, 1, 5, 6, 10 (see the RAID PIDs section in this table)
UCS-RAID-9266NB	LSI MegaRAID SAS 9266-8i RAID controller card with no data cache backup (RAID 0, 1, 5, 6, 10, 50, and 60 supported), operating at 6 Gbs. ■ Supports up to eight internal SAS+ATA drives (limited to four drives for the C220 M3 LFF chassis). SAS and SATA drives can be mixed**.** ■ Includes 1 GB of write cache ■ Factory-configured RAID options available: RAID 0, 1, 5, 6, and 10 (see the RAID PIDs section in this table)

Table 7 Available Plug-In PCIe Card RAID Options *(continued)*

Product ID (PID)	PID Description
UCS-RAID-9285CV-E	LSI MegaRAID SAS 9285CV-e (RAID 0, 1, 5, 6, 10) ■ Supports eight external SAS ports (up to 240 external drives). **NOTE:** For SAS 9285CV-8e external drive enclosure support, see the compatibility list (enclosure section) at the following link: *http://tinyurl.com/b4etshk* Cisco is able to support customers with questions related to the SAS 9285CV-8e RAID card; however, customers should contact their storage vendor for technical support related to enclosure/JBOD. ■ Includes an chassis-mount (remote) supercapacitor to power on-board 1 GB flash-backed write cache. ■ Factory-configured RAID options: RAID 0, 1, 5, 6, 10 (see the RAID Configuration section in this table)
Super Capacitor Option	
UCS-RAID-CV-SC=	LSI CacheVault Power Module for SAS 9266CV-8i. This is a spare supercapacitor. It is the exact same supercapacitor that ships with the 9266CV-8i and 9285CV-8e cards listed earlier in this table and can be used as a replacement or upgrade part.

Table 7 Available Plug-In PCIe Card RAID Options *(continued)*

Product ID (PID)	PID Description
RAID Configuration Options (not available for embedded RAID)	
R2XX-SRAID0	Enable Single Disk Raid 0 Setting (for the following PIDs only): ■ UCS-RAID-9266-NB ■ UCS-RAID-9266CV ■ UCSC-RAID-11-C220 ■ UCSC-RAID-MZ-220
R2XX-RAID0	Factory preconfigured RAID striping option Enable RAID 0 Setting. Requires a minimum of one hard drive.
R2XX-RAID1	Factory preconfigured RAID mirroring option Enable RAID 1 Setting. Requires exactly two drives with the same size, speed, capacity.
R2XX-RAID5	Factory preconfigured RAID option Enable RAID 5 Setting. Requires a minimum of three drives of the same size, speed, capacity.
R2XX-RAID6	Factory preconfigured RAID option Enable RAID 6 Setting. Requires a minimum of four drives of the same size, speed, capacity.
R2XX-RAID10	Factory preconfigured RAID option Enable RAID 10 Setting. Requires a even number of drives (minimum of four drives) of the same size, speed, capacity.

NOTE: Although RAID levels 50 and 60 are not orderable from the factory, they are supported for selected controllers as shown in *Table 5*

Approved Configurations

(1) 1-CPU Configurations

Mezzanine cards are not supported for 1-CPU configurations, Therefore, only the following RAID controllers are supported for single-CPU configurations:

- Embedded RAID (on motherboard)
- LSI MegaRAID SAS 9266-8i (PCIe slot 1 only)
- LSI MegaRAID SAS 9266CV-8i (PCIe slot 1 only)
- LSI MegaRAID SAS 9285CV-8e (PCIe slot 1 only)

NOTE: PCIe slot 2 is not supported for 1-CPU configurations

Select an embedded RAID option from *Table 5 on page 17*, or one internal or external drive PCIe RAID controller or one of each from *Table 7 on page 18*. You may also select an appropriate optional RAID configuration listed in *Table 7 on page 18*

(2) 2-CPU Configurations

Select an embedded RAID option from *Table 5*, or one mezzanine RAID controller from *Table 6 on page 17*, or one internal or external drive PCIe RAID controller or one of each from *Table 7 on page 18*. You may also select an appropriate optional RAID configuration listed in *Table 7 on page 18*.

(3) Available RAID Controller Combinations

NOTE: For more important information regarding RAID combinations and support, see *RAID Summary, page 55* and *RAID Option ROM (OPROM) Settings, page 57*.

Caveats

- Note that only a single Cisco VIC card (the half-height Cisco VIC 1225 PCIe card) is supported and it must be installed in the full-height PCIe slot (slot 1) on riser 1. So take this into account when populating RAID controller cards.
- You can choose an optional RAID configuration (RAID 0, 1, 5, 6, or 10), which is preconfigured at the factory. The RAID level you choose must be an available RAID choice for the controller selected. RAID levels 50 and 60 are supported, although they are not available as configuration options.

NOTE: For more important information regarding RAID support, see *RAID Summary, page 55* and *RAID Option ROM (OPROM) Settings, page 57*.

STEP 5 SELECT HARD DISK DRIVES (HDDs)

The standard disk drive features are:

- 3.5-inch large form factor
- Hot-pluggable
- Sled-mounted

Select Drives

The available drives are listed in *Table 8*.

Table 8 Available Hot-Pluggable Sled-Mounted HDDs

Product ID (PID)	PID Description	Drive Type	Capacity
HDDs			
UCS-HDD3TI2F214	3 TB SAS 7.2K RPM 3.5 inch HDD	SAS	3 TB
UCS-HDD2TI2F213	2 TB SAS 7.2K RPM 3.5 inch HDD	SAS	2 TB
UCS-HDD1TI2F212	1 TB SAS 7.2K RPM 3.5 inch HDD	SAS	1 TB
UCS-HDD600GI2F210	600 GB SAS 15K RPM 3.5 inch HDD	SAS	600 GB
UCS-HDD450GI2F209	450 GB SAS 15K RPM 3.5 inch HDD	SAS	450 GB
UCS-HDD500GI1F211	500 GB SATA 7.2K RPM 3.5 inch HDD	SAS	500 GB
UCS-HDD300GI2F208	300 GB SAS 15K RPM 3.5 inch HDD	SAS	300 GB

NOTE: When creating a RAID volume, follow these guidelines:

- Use the same capacity for each drive in the volume
- Use either all SAS drives or all SATA drives
- Use either all HDDs or all SSDs

Approved Configurations

(1) Onboard RAID, mezzanine cards, and internal drive plug-in RAID controllers

- If you have not selected an onboard RAID upgrade option (Intel RSTe, LSI ROM1, or LSI ROM15), a mezzanine card, or a plug-in RAID controller for internal drives (LSI MegaRAID SAS 9266-8i or LSI MegaRAID SAS 9266CV-8i), you may select up to 4 SATA-only drives, which will be controlled with the embedded SATA-only RAID controller.
- Otherwise, select up to four SAS+SATA drives listed in *Table 8*. You can mix SAS and SATA drives.

Caveats

- You can mix SATA and SAS drives.

STEP 6 SELECT PCIe OPTION CARD(s)

The standard PCIe card offerings are:

- Converged Network Adapters (CNAs)
- Network Interface Cards (NICs)
- Host Bus Adapters (HBAs)

Select PCIe Option Cards

The available PCIe option cards are listed in *Table 9*.

Table 9 Available PCIe Option Cards

Product ID (PID)	PID Description	Card Height
Converged Network Adapters (CNAs)		
UCSC-PCIE-BSFP	Broadcom 57712 Dual Port 10Gb SFP+ w/TOE iSCSI	Half
UCSC-PCIE-CSC-02	Cisco VIC 1225 Dual Port 10Gb SFP+ CNA	Half
UCSC-PCIE-C10T-02	Cisco VIC 1225T Dual Port 10GBaseT CNA	Half
UCSC-PCIE-ESFP	Emulex OCe11102-FX dual-port 10 GbE FCoE CNA (Gen 3 CNA)	Half
UCSC-PCIE-QSFP	Qlogic QLE8242-CU dual-port 10 GbE FCoE CNA	Half
UCSC-PCIE-B3SFP	Broadcom 57810 10Gb A-FEX SFP+	Half
Network Interface Cards (NICs)		
N2XX-ABPCI01-M3	Broadcom 5709 Dual Port 1Gb w/TOE iSCSI for M3 Servers	Half
N2XX-ABPCI03-M3	Broadcom 5709 Quad Port 1Gb w/TOE iSCSI for M3 Servers	Half
N2XX-AIPCI01	Intel X520 Dual Port 10Gb SFP+ Adapter	Half
UCSC-PCIE-ITG	Intel X540 Dual Port 10GBase-T Adapter	Half
UCSC-PCIE-IRJ45	Intel i350 Quad Port 1Gb Adapter	Half
UCSC-PCIE-BTG	Broadcom 57712 Dual Port 10GBASE-T w/TOE iSCSI	Half
Host Bus Adapters (HBAs)		
N2XX-AEPCI03	Emulex LPe 11002 Dual Port 4Gb Fibre Channel HBA	Half
N2XX-AEPCI05	Emulex LPe 12002 Dual Port 8Gb Fibre Channel HBA	Half
N2XX-AQPCI03	Qlogic QLE2462 Dual Port 4Gb Fibre Channel HBA	Half
N2XX-AQPCI05	Qlogic QLE2562 Dual Port 8Gb Fibre Channel HBA	Half

Approved Configurations

(1) No RAID controller plug-in card

- If you did not choose a plug-in RAID controller (for example, you are using embedded RAID or a mezzanine RAID controller), you can select up to one PCIe option card (for 1-CPU systems) or two PCIe option cards (for 2-CPU systems) listed in *Table 9 on page 24*.

(2) One RAID controller plug-in card

- If you selected a plug-in PCIe RAID controller, you can select none of the optional PCIe cards (for 1-CPU systems) or one of the optional PCIe cards (for 2-CPU systems) listed in *Table 9 on page 24*.

NOTE: If a plug-in RAID controller card is installed, any optional PCIe card you select will be installed in the full-height slot. RAID controllers are always installed in the half-height slot.

Caveats

- For 1-CPU systems:
  - Only the full-height PCIe slot (slot 1) is supported
  - Neither PCIe slot 2 nor the mezzanine card slot are supported
  - Only a single VIC card (the Cisco VIC 1225 PCIe card) is supported and it must be installed in slot 1 (the full-height slot).
- For 2-CPU systems:
  - Both PCIe slots (slots 1 and 2) and the mezzanine card slot are supported
  - Only a single VIC card (the half-height Cisco VIC 1225 PCIe card) is supported and it must be installed in slot 1 (the full height slot).
- All PCIe cards will fit in either slot.
- Other considerations for the Cisco VIC 1225:
  - Supports 10G SFP+ optical and copper twinax connections
  - The server supports installation of one Cisco VIC 1225 card and it is supported only in PCIe slot 1.
  - Requires that the server has CIMC firmware version 1.4(6) or later installed. There is a heartbeat LED on the top of the card that indicates when firmware is active.
  - To use this card for UCS integration (Cisco UCS Manager mode) with Cisco UCS Manager 2.1(0) or later, the minimum card-firmware and uboot image level is 2.1(0.306).
- To help ensure that your operating system is compatible with the card you have selected, check the Hardware Compatibility List at this URL:

  http://www.cisco.com/en/US/products/ps10477/prod_technical_reference_list.html

STEP 7 ORDER OPTIONAL NETWORK CARD ACCESSORIES

Copper twinax cables and SFP optical modules may be ordered to support the two-port network cards that are available with the server.

Choose Optional Twinax Cables

Table 10 lists the copper twinax cables available for the PCIe cards. You can choose cable lengths of 1, 3, 5, 7, or 10 meters. The two longer cables (7 and 10 meters) are active, which means that they contain active components within the SFP+ housing to improve signal quality.

Table 10 Available Twinax Cables

Product ID (PID)	PID Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable (1 M)
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable (3 M)
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable (5 M)
SFP-H10GB-ACU7M	10GBASE-CU SFP+ Cable (7 M)
SFP-H10GB-ACU10M	10GBASE-CU SFP+ Cable (10 M)

Approved Configurations

(1) Choose Up to Two Twinax Cables for Each Network Card Ordered

- You may choose one or two twinax cables for each network card ordered. The cables can be different lengths; however, you would normally order two cables of equal lengths to connect to the primary and redundant network switching equipment.

Caveats

The twinax cables listed in *Table 10* can be ordered only for the following PCIe cards:

- UCS-PCIE-BSFP (Broadcom 57712)
- N2XX-AIPCI01 (Intel Dual Port Ethernet X520)
- UCSC-PCIE-CSC-02 (Cisco VIC 1225 Dual Port 10Gb SFP+ CNA)

Choose Optional SFP Modules

Optical Cisco SFP+ modules are listed in *Table 11*.

Table 11 Available SFP Modules

Product ID (PID)	PID Description
SFP-10G-SR	10GBASE-SR SFP+ Module 850 nm, multimode, SR, 3.3V, LC connector, with Digital Optical Monitoring
DS-SFP-FC8G-SW	8 Gbit SFP+ Module 850 nm, multimode, SR, 3.3V, LC connector, with Digital Optical Monitoring

Approved Configurations

(1) Choose Up to Two SFP+ Modules for Each Network Card Ordered

- You may choose one or two SFP+ optical modules cables for each network card ordered. You would normally order two modules for connecting to the primary and redundant network switching equipment. With the SFP+ optical modules, you can use common fiber optic cables, widely available.

See *Figure 4 on page 28* for typical SFP+ and twinax connections to the network cards.

Caveats

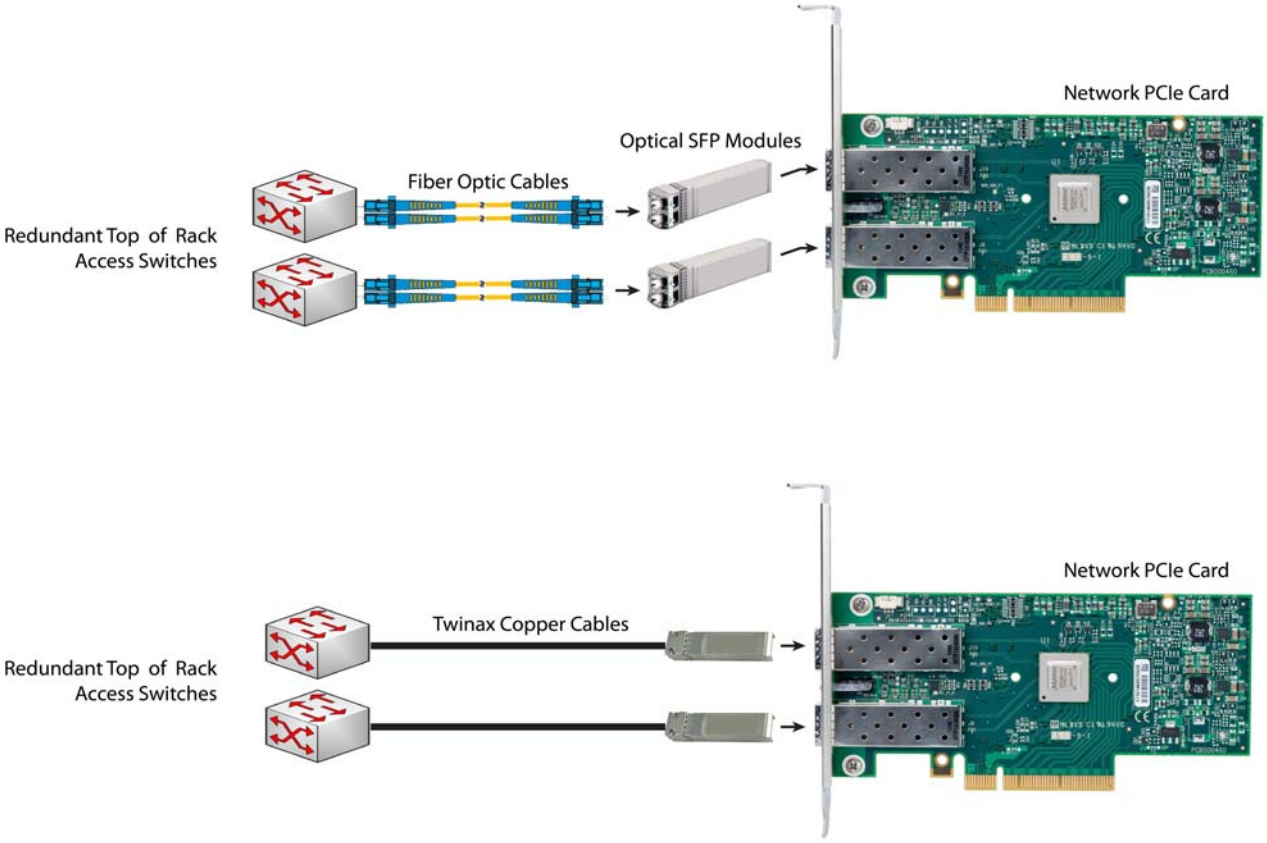
The SFP-10G-SR optical module listed in *Table 11* should be ordered only for the following PCIe cards, as they do not come by default with any optical modules:

- UCSC-PCIE-BSFP (Broadcom 57712)
- N2XX-ABPCI02 (Broadcom 57711)
- UCSC-PCIE-CSC-02 (Cisco VIC 1225 Dual Port 10Gb SFP+ CNA)

The DS-SFP-FC8G-SW optical module listed in *Table 11* should be ordered only for the following PCIe cards, as they do not come by default with any optical modules:

- N2XX-AEPCI05 (Emulex LPe 12002, 8Gb dual-port Fibre Channel HBA)

Figure 4 Network Card Connections



STEP 8 ORDER POWER SUPPLY

The C220 M3 LFF server accommodates two power supplies. A lightly loaded server can operate from one 650 W power supply. A fully loaded server might need to be powered with two 450 W or two 650 W power supplies (see *Table 12*). Use the power calculator at the following link to determine the needed power based on the options chosen (CPUs, drives, memory, and so on):

https://express.salire.com/Go/Cisco/Cisco-UCS-Power-Calculator.aspx

Table 12 Power Supply PIDs

Product ID (PID)	PID Description
UCSC-PSU-450W	450 W power supply
UCSC-PSU-650W	650 W power supply

NOTE: In a two power supply server, both power supplies must be identical.

STEP 9 SELECT AC POWER CORD(s)

Using *Table 13*, select the appropriate AC power cords. You can select a minimum of no power cords and a maximum of two. If you select the option R2XX-DMYMPWRCORD, no power cord is shipped with the server.

Table 13 Available Power Cords

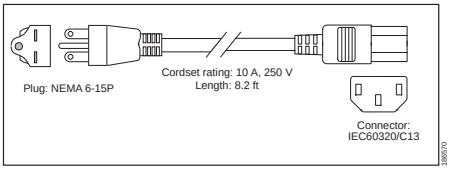
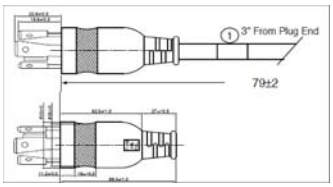
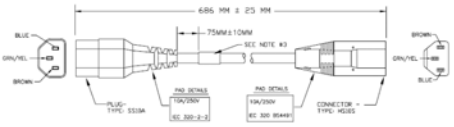
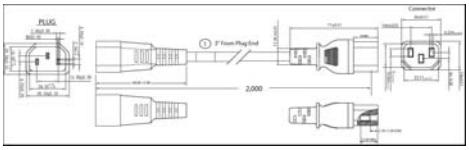
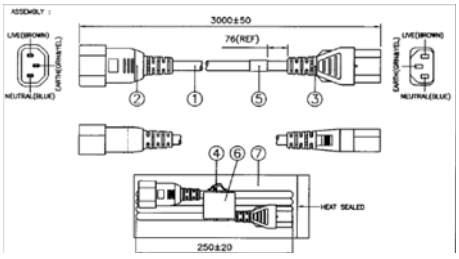
Product ID (PID)	PID Description	Images
R2XX-DMYMPWRCORD	No power cord (dummy PID to allow for a no power cord option)	Not applicable
CAB-N5K6A-NA	Power Cord, 200/240V 6A, North America	
CAB-AC-L620-C13	AC Power Cord, NEMA L6-20 - C13, 2M/6.5ft	
CAB-C13-CBN	CABASY,WIRE,JUMPER CORD, 27" L, C13/C14, 10A/250V	
CAB-C13-C14-2M	CABASY,WIRE,JUMPER CORD, PWR, 2 Meter, C13/C14,10A/250V	
CAB-C13-C14-AC	CORD,PWR,JMP,IEC60320/C14,IEC60320/C13, 3.0M	

Table 13 Available Power Cords

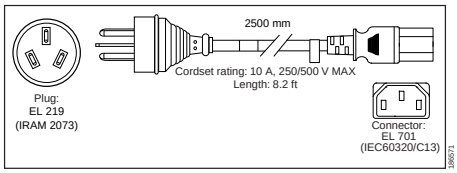
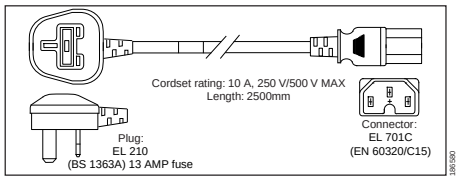
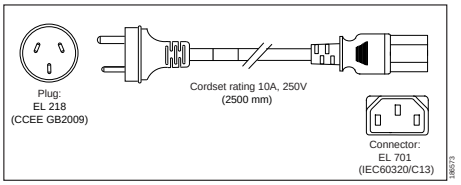
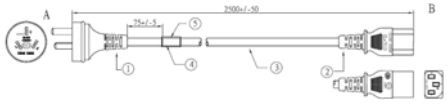
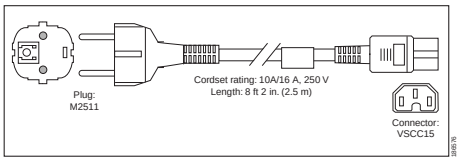
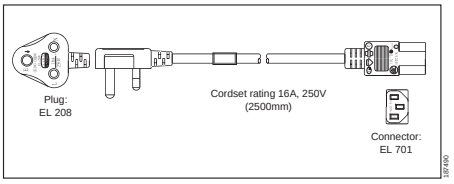
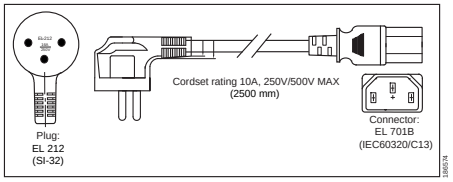
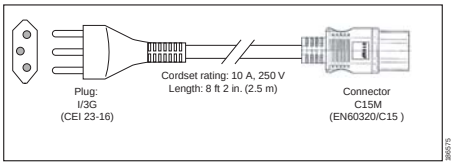
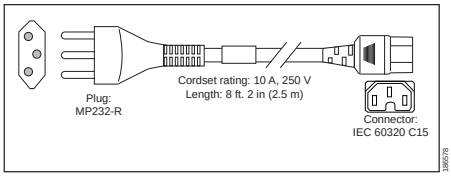
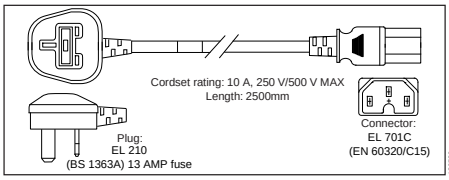
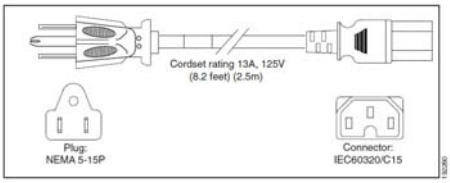
Product ID (PID)	PID Description	Images
SFS-250V-10A-AR	Power Cord, SFS, 250V, 10A, Argentina	
CAB-9K10A-AU	Power Cord, 250VAC 10A 3112 Plug, Australia	
SFS-250V-10A-CN	Power Cord, SFS, 250V, 10A, China	
CAB-250V-10A-CN	AC Power Cord - 250V, 10A - PRC	
CAB-9K10A-EU	Power Cord, 250VAC 10A CEE 7/7 Plug, EU	
SFS-250V-10A-ID	Power Cord, SFS, 250V, 10A, India	
SFS-250V-10A-IS	Power Cord, SFS, 250V, 10A, Israel	

Table 13 Available Power Cords

Product ID (PID)	PID Description	Images
CAB-9K10A-IT	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy	
CAB-9K10A-SW	Power Cord, 250VAC 10A MP232 Plug, Switzerland	
CAB-9K10A-UK	Power Cord, 250VAC 10A BS1363 Plug (13 A fuse), UK	
CAB-9K12A-NA	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	
CAB-JPN-3PIN	Power Cord 3PIN, Japan	Image not available

STEP 10 ORDER OPTIONAL REVERSIBLE CABLE MANAGEMENT ARM

The reversible cable management arm mounts on either the right or left slide rails at the rear of the server and is used for cable management. Use *Table 14* to order a cable management arm.

Table 14 Cable Management Arm

Product ID (PID)	PID Description
UCSC-CMA1	Cable Management Arm for C220 rack servers

For more information about the cable management arm, see the *Cisco UCS C220 M3 Installation and Service Guide* at this URL:

http://www.cisco.com/en/US/docs/unified_computing/ucs/c/hw/C220/install/C220.pdf

NOTE: All UCS C220 M3 servers ship with a tool-less rail kit.

STEP 11 ORDER A TRUSTED PLATFORM MODULE (OPTIONAL)

Trusted Platform Module (TPM) is a computer chip (microcontroller) that can securely store artifacts used to authenticate the platform (server). These artifacts can include passwords, certificates, or encryption keys. A TPM can also be used to store platform measurements that help ensure that the platform remains trustworthy. Authentication (ensuring that the platform can prove that it is what it claims to be) and attestation (a process helping to prove that a platform is trustworthy and has not been breached) are necessary steps to ensure safer computing in all environments.

The TPM ordering information is listed in *Table 15*.

Table 15 Trusted Platform Module

Product ID (PID)	PID Description
UCSX-TPM1-001	Trusted Platform Module

STEP 12 ORDER CISCO FLEXIBLE FLASH SD CARD MODULE (OPTIONAL)

You can order one optional preloaded 16 GB Cisco Flexible Flash secure digital (SD) card. This SD card contains preloaded software for simplified server operation. The ordering information is listed in *Table 16*.

Table 16 Secure Digital (SD) Card (preloaded with software)

Product ID (PID)	PID Description
UCSC-SD-16G-C220	16GB SD Card for C220 servers

See *Figure 5 on page 48* for the location of the SD cards. There are two locations, SD1 and SD2.

NOTE: You can order an optional second blank SD card. The PID for the second SD (blank) card is shown in *Table 17*.

Table 17 Second Secure Digital (SD) Card (blank)

Product ID (PID)	PID Description
UCSC-SD-16G	16GB SD Card (optional)

STEP 13 ORDER USB 2.0 DRIVE (OPTIONAL)

You can order one optional USB 2.0 drive. The USB drive ordering information is listed in *Table 18*.

Table 18 USB 2.0 Drive

Product ID (PID)	PID Description
UCS-USBFLSH-S-4GB	4GB Flash USB Drive (shorter length) for all servers except C260

See *Figure 5 on page 48* for the location of the USB connector.

STEP 14 SELECT OPERATING SYSTEM

Several operating systems are available from which to choose. Select one of the operating systems shown in *Table 19*.

Table 19 Operating Systems

PID Description	Product ID (PID)
SUSE Linux Enterprise Server	
SLES-1A	SLES/1yr subscription/svcs required/0 media
SLES-3A	SLES/3yr subscription/svcs required/0 media
Red Hat Enterprise Linux	
RHEL-2S-1G-1A	RHEL/2 Socket/1 Guest/1Yr Svcs Required
RHEL-2S-1G-3A	RHEL/2 Socket/1 Guest/3Yr Svcs Required
RHEL-2S-4G-1A	RHEL/2 Socket/4 Guest/1Yr Svcs Required
RHEL-2S-4G-3A	RHEL/2 Socket/4 Guest/3Yr Svcs Required
RHEL-2S-UG-1A	RHEL/2 Socket/U Guest/1Yr Svcs Required
RHEL-2S-UG-3A	RHEL/2 Socket/U Guest/3Yr Svcs Required
RHEL Add-Ons	
RHEL-HA-2S-1A	RHEL Option/High-Availability/2 Socket/1Yr Svcs Required
RHEL-RS-2S-1A	RHEL Option/Resilient w/Ha /2 Socket/1 Yr Svcs Required
RHEL-SFS-2S-1A	RHEL Option/Scalable File System/2 Socket/1 Yr Svcs Required
RHEL-HA-2S-3A	RHEL Option/High-Availability/2 Socket/3Yr Svcs Required
RHEL-RS-2S-3A	RHEL Option/Resilient Storage w/ HA /2 Socket/3 Yr Svcs Reqd
RHEL-SFS-2S-3A	RHEL Option/Scalable File System/2 Socket/3 Yr Svcs Required
Windows Server	
MSWS-08R2-STHV	Windows Svr 2008 ST media R2 ST (1-4CPU, 5CAL)
MSWS-08R2-ENHV	Windows Svr 2008 EN media R2 EN (1-8CPU, 25CAL)
MSWS-08R2-DCHV2S	Windows Svr 2008 R2-2 CPU-Data Center
MSWS-08R2-DCHV4S	Windows Svr 2008 R2-4 CPU-Data Center
VMWare Server	
VMW-VS5-STD-1A	VMware vSphere 5 Standard for 1 Processor, 1 Year, Support Required
VMW-VS5-STD-2A	VMware vSphere 5 Standard for 1 Processor, 2 Year, Support Required

Table 19 Operating Systems *(continued)*

PID Description	Product ID (PID)
VMW-VS5-STD-3A	VMware vSphere 5 Standard for 1 Processor, 3 Year, Support Required
VMW-VS5-STD-4A	VMware vSphere 5 Standard for 1 Processor, 4 Year, Support Required
VMW-VS5-STD-5A	VMware vSphere 5 Standard for 1 Processor, 5 Year, Support Required
VMW-VS5-ENT-1A	VMware vSphere 5 Enterprise for 1 Processor, 1 Year Support Required
VMW-VS5-ENT-2A	VMware vSphere 5 Enterprise for 1 CPU, 2 Yr Support Required
VMW-VS5-ENT-3A	VMware vSphere 5 Enterprise for 1 CPU, 3 Yr Support Required
VMW-VS5-ENT-4A	VMware vSphere 5 Enterprise for 1 Processor, 4 Year Support Required
VMW-VS5-ENT-5A	VMware vSphere 5 Enterprise for 1 CPU, 5 Yr Support Required
VMW-VS5-ENTP-1A	VMware vSphere 5 Enterprise Plus for 1 Processor, 1 Year Support Required
VMW-VS5-ENTP-2A	VMware vSphere 5 Enterprise Plus for 1 CPU, 2 Yr Support Required
VMW-VS5-ENTP-3A	VMware vSphere 5 Enterprise Plus for 1 Processor, 3 Year Support Required
VMW-VS5-ENTP-4A	VMware vSphere 5 Enterprise Plus for 1 Processor, 4 Year Support Required
VMW-VS5-ENTP-5A	VMware vSphere 5 Enterprise Plus for 1 Processor, 5 Year Support Required

STEP 15 SELECT OPERATING SYSTEM MEDIA KIT

Select the optional operating system media listed in *Table 20*.

Table 20 OS Media

Product ID (PID)	PID Description
RHEL-6	RHEL 6 Recovery Media Only (Multilingual)
SLES-11	SLES 11 media only (multilingual)
MSWS-08R2-STHV-RM	Windows Svr 2008 R2 ST (1-4CPU, 5CAL), Media
MSWS-08R2-ENHV-RM	Windows Svr 2008 R2 EN (1-8CPU, 25CAL), Media
MSWS-08R2-DCHV-RM	Windows Svr 2008 R2 DC (1-8CPU, 25CAL), Media

STEP 16 SELECT OPTIONAL VALUE-ADDED SOFTWARE

You can select from a variety of value-added software listed in *Table 21*.

Table 21 Value Added Software

Product ID (PID)	PID Description
BMC-SE-4C	BMC BladeLogic Standard Edition, 4 Cores, Support Required
BMC-SE-6C	BMC BladeLogic Standard Edition, 6 Cores, Support Required
BMC-SE-8C	BMC BladeLogic Standard Edition, 8 Cores, Support Required
BMC-SE-10C	BMC BladeLogic Standard Edition, 10 Cores, Support Required
BMC-AE-4C	BladeLogic Advanced Edition, 4 Cores, Support Required
BMC-AE-6C	BMC BladeLogic Advanced Edition, 6 Cores, Support Required
BMC-AE-8C	BMC BladeLogic Advanced Edition, 8 Cores, Support Required
BMC-AE-10C	BMC BladeLogic Advanced Edition, 10 Cores, Support Required
BMC-002	BMC BladeLogic CM for Physical Cisco Servers
BMC-012	BMC BPPM Per Server
VMW-VC5-STD-1A	VMware vCenter 5 Standard for 1 Processor, 1 Year, Support Required
VMW-VC5-STD-2A	VMware vCenter 5 Standard for 1 Processor, 2 Year, Support Required
VMW-VC5-STD-3A	VMware vCenter 5 Standard for 1 Processor, 3 Year, Support Required
VMW-VC5-STD-4A	VMware vCenter 5 Standard for 1 Processor, 4 Year, Support Required
VMW-VC5-STD-5A	VMware vCenter 5 Standard for 1 Processor, 5 Year, Support Required
N1K-VLEM-UCS-1	Nexus 1000V License PAK for 1 Virtual Ethernet module
N1K-CSK9-UCS-404	Nexus 1000V VSM Virtual Appliance Software

STEP 17 SELECT SERVICE and SUPPORT LEVEL

A variety of service options are available, as described in this section.

Unified Computing Warranty, No Contract

If you have noncritical implementations and choose to have no service contract, the following coverage is supplied:

- Three-year parts coverage.
- Next business day (NBD) onsite parts replacement eight hours a day, five days a week.
- 90-day software warranty on media.
- Ongoing downloads of BIOS, drivers, and firmware updates.
- UCSM updates for systems with Unified Computing System Manager. These updates include minor enhancements and bug fixes that are designed to maintain the compliance of UCSM with published specifications, release notes, and industry standards.

SMARTnet for UCS

For support of the entire Unified Computing System, Cisco offers the Cisco SMARTnet for UCS Service. This service provides expert software and hardware support to help sustain performance and high availability of the unified computing environment. Access to Cisco Technical Assistance Center (TAC) is provided around the clock, from anywhere in the world.

For UCS blade servers, there is Smart Call Home, which provides proactive, embedded diagnostics and real-time alerts. For systems that include Unified Computing System Manager, the support service includes downloads of UCSM upgrades. The Cisco SMARTnet for UCS Service includes flexible hardware replacement options, including replacement in as little as two hours. There is also access to Cisco's extensive online technical resources to help maintain optimal efficiency and uptime of the unified computing environment. You can choose a desired service listed in *Table 22*.

Table 22 Cisco SMARTnet for UCS Service

Product ID (PID)	On Site?	Description
CON-PREM-C220M3LF	Yes	ONSITE 24X7X2 UCS C220 M3 Server - LFF
CON-OSP-C220M3LF	Yes	ONSITE 24X7X4 UCS C220 M3 Server - LFF
CON-OSE-C220M3LF	Yes	ONSITE 8X5X4 UCS C220 M3 Server - LFF
CON-OS-C220M3LF	Yes	ONSITE 8X5XNBD UCS C220 M3 Server - LFF
CON-S2P-C220M3LF	No	SMARTNET 24X7X2 UCS C220 M3 Server - LFF
CON-SNTP-C220M3LF	No	SMARTNET 24X7X4 UCS C220 M3 Server - LFF
CON-SNTE-C220M3LF	No	SMARTNET 8X5X4 UCS C220 M3 Server - LFF
CON-SNT-C220M3LF	No	SMARTNET 8X5XNBD UCS C220 M3 Server - LFF

SMARTnet for UCS Hardware Only Service

For faster parts replacement than is provided with the standard Cisco Unified Computing System warranty, Cisco offers the Cisco SMARTnet for UCS Hardware Only Service. You can choose from two levels of advanced onsite parts replacement coverage in as little as four hours. SMARTnet for UCS Hardware Only Service provides remote access any time to Cisco support professionals who can determine if a return materials authorization (RMA) is required. You can choose a service listed in *Table 23*.

Table 23 SMARTnet for UCS Hardware Only Service

Product ID (PID)	Service Level GSP	On Site?	Description
CON-UCW7-C220M3LF	UCW7	Yes	UC PLUS 24X7X4OS UCS C220 M3 Server - LFF
CON-UCW5-C220M3LF	UCW5	Yes	UC PLUS 8X5XNBDOS UCS C220 M3 Server - LFF

Unified Computing Partner Support Service

Cisco Partner Support Service (PSS) is a Cisco Collaborative Services service offering that is designed for partners to deliver their own branded support and managed services to enterprise customers. Cisco PSS provides partners with access to Cisco's support infrastructure and assets to help them:

- Expand their service portfolios to support the most complex network environments
- Lower delivery costs
- Deliver services that increase customer loyalty

Partner Unified Computing Support Options enable eligible Cisco partners to develop and consistently deliver high-value technical support that capitalizes on Cisco intellectual assets. This helps partners to realize higher margins and expand their practice.

PSS is available to all Cisco PSS partners, but requires additional specializations and requirements. For additional information, see the following URL:

www.cisco.com/go/partnerucssupport

The two Partner Unified Computing Support Options include:

- Partner Support Service for UCS
- Partner Support Service for UCS Hardware Only

Partner Support Service for UCS provides hardware and software support, including triage support for third party software, backed by Cisco technical resources and level three support. See *Table 24*.

Table 24 Partner Support Service for UCS

Product ID (PID)	Service Level GSP	On Site?	Description
CON-PSJ1-C220M3LF	PSJ1	No	UCS SUPP PSS 8X5XNBD UCS C220 M3 Server - LFF
CON-PSJ2-C220M3LF	PSJ2	No	UCS SUPP PSS 8X5X4 UCS C220 M3 Server - LFF
CON-PSJ3-C220M3LF	PSJ3	No	UCS SUPP PSS 24X7X4 UCS C220 M3 Server - LFF
CON-PSJ4-C220M3LF	PSJ4	No	UCS SUPP PSS 24X7X2 UCS C220 M3 Server - LFF

Partner Support Service for UCS Hardware Only provides customers with replacement parts in as little as two hours. See *Table 25*.

Table 25 Partner Support Service for UCS (Hardware Only)

Product ID (PID)	Service Level GSP	On Site?	Description
CON-PSW2-C220M3LF	PSW2	No	UCS W PL PSS 8X5X4 UCS C220 M3 Server - LFF
CON-PSW3-C220M3LF	PSW3	No	UCS W PL PSS 24X7X4 UCS C220 M3 Server - LFF
CON-PSW4-C220M3LF	PSW4	No	UCS W PL PSS 24X7X2 UCS C220 M3 Server - LFF

Unified Computing Combined Support Service

Combined Services makes it easier to purchase and manage required services under one contract. SMARTnet services for UCS help increase the availability of your vital data center infrastructure and realize the most value from your unified computing investment. The more benefits you realize from the Cisco Unified Computing System (Cisco UCS), the more important the technology becomes to your business. These services allow you to:

- Optimize the uptime, performance, and efficiency of your UCS
- Protect your vital business applications by rapidly identifying and addressing issues
- Strengthen in-house expertise through knowledge transfer and mentoring
- Improve operational efficiency by allowing UCS experts to augment your internal staff resources
- Enhance business agility by diagnosing potential issues before they affect your operations

You can choose a service listed in *Table 26*.

Table 26 UCS Computing Combined Support Service

Product ID (PID)	Service Level GSP	On Site?	Description
CON-NCF2-C220M3LF	NCF2	No	CMB SPT SVC 24X7X2 UCS C220 M3 Server - LFF
CON-NCF2P-C220M3LF	NCF2P	Yes	CMB SPT SVC 24X7X2OS UCS C220 M3 Server - LFF
CON-NCF4P-C220M3LF	NCF4P	Yes	CMB SPT SVC 24X7X4OS UCS C220 M3 Server - LFF
CON-NCF4S-C220M3LF	NCF4S	Yes	CMB SPT SVC 8X5X4OS UCS C220 M3 Server - LFF
CON-NCFCS-C220M3LF	NCFCS	Yes	CMB SPT SVC 8X5XNBDOS UCS C220 M3 Server - LFF
CON-NCFE-C220M3LF	NCFE	No	CMB SPT SVC 8X5X4 UCS C220 M3 Server - LFF
CON-NCFP-C220M3LF	NCFP	No	CMB SPT SVC 24X7X4 UCS C220 M3 Server - LFF
CON-NCFT-C220M3LF	NCFT	No	CMB SPT SVC 8X5XNBD UCS C220 M3 Server - LFF

Unified Computing Drive Retention Service

With the Cisco Unified Computing Drive Retention (UCDR) Service, you can obtain a new disk drive in exchange for a faulty drive without returning the faulty drive. In exchange for a Cisco replacement drive, you provide a signed Certificate of Destruction (CoD) confirming that the drive has been removed from the system listed, is no longer in service, and has been destroyed.

Sophisticated data recovery techniques have made classified, proprietary, and confidential information vulnerable, even on malfunctioning disk drives. The UCDR service enables you to retain your drives and ensures that the sensitive data on those drives is not compromised, which reduces the risk of any potential liabilities. This service also enables you to comply with regulatory, local, and federal requirements.

If your company has a need to control confidential, classified, sensitive, or proprietary data, you might want to consider one of the Drive Retention Services listed in *Table 27*.

NOTE: Cisco does not offer a certified drive destruction service as part of this service.

Table 27 Drive Retention Service Options

Service Description	Service Program Name	Service Level GSP	Service Level	Product ID (PID)
SMARTnet for UCS Service with Drive Retention	UCS DR	UCSD7	24x7x4 Onsite	CON-UCSD7-C220M3LF
		UCSD7	8x5xNBD Onsite	CON-UCSD5-C220M3LF
SMARTnet for UCS HW ONLY+Drive Retention	UCS HW+DR	UCWD7	24x7x4 Onsite	CON-UCWD7-C220M3LF
		UCWD5	8x5xNBD Onsite	CON-UCWD5-C220M3LF

For more service and support information, see the following URL:

http://www.cisco.com/en/US/services/ps2961/ps10312/Unified_Computing_Services_Overview.pdf

For a complete listing of available services for Cisco Unified Computing System, see this URL:

http://www.cisco.com/en/US/products/ps10312/serv_group_home.html

OPTIONAL STEP - ORDER RACK(s)

The optional R42610 rack is available from Cisco for the C-Series servers, including the C220 M3 LFF server. This rack is a standard 19-inch rack and can be ordered with a variety of options, as listed in *Table 28*. Racks are shipped separately from the C220 M3 LFF server.

Table 28 Racks and Rack Options

Product ID (PID)	PID Description
RACK-UCS[1]	Cisco R42610 expansion rack, no side panels
RACK-UCS2[1]	Cisco R42610 standard rack, w/side panels
RACK-BLANK-001	Filler panels (qty 12), 1U, plastic, toolless
RACK-CBLMGT-001	Cable mgt D rings (qty 10), metal
RACK-CBLMGT-011	Cable mgt straps (qty 10), Velcro
RACK-FASTEN-001	Mounting screws (qty 100), M6
RACK-FASTEN-002	Cage nuts (qty 50), M6
RACK-JOIN-001	Rack joining kit

Notes . . .

1. Use these same base PIDs to order spare racks (available only as next-day replacements).

For more information about the R42610 rack, see *RACKS, page 61*.

OPTIONAL STEP - ORDER PDU

An optional power distribution unit (PDU) is available from Cisco for the C-Series rack servers, including the C220 M3 server. This PDU is available in a zero rack unit (RU) style (see *Table 28*).

Table 29 PDU Options

Product ID (PID)	PID Description
RP208-30-2P-U-2	Zero RU PDU

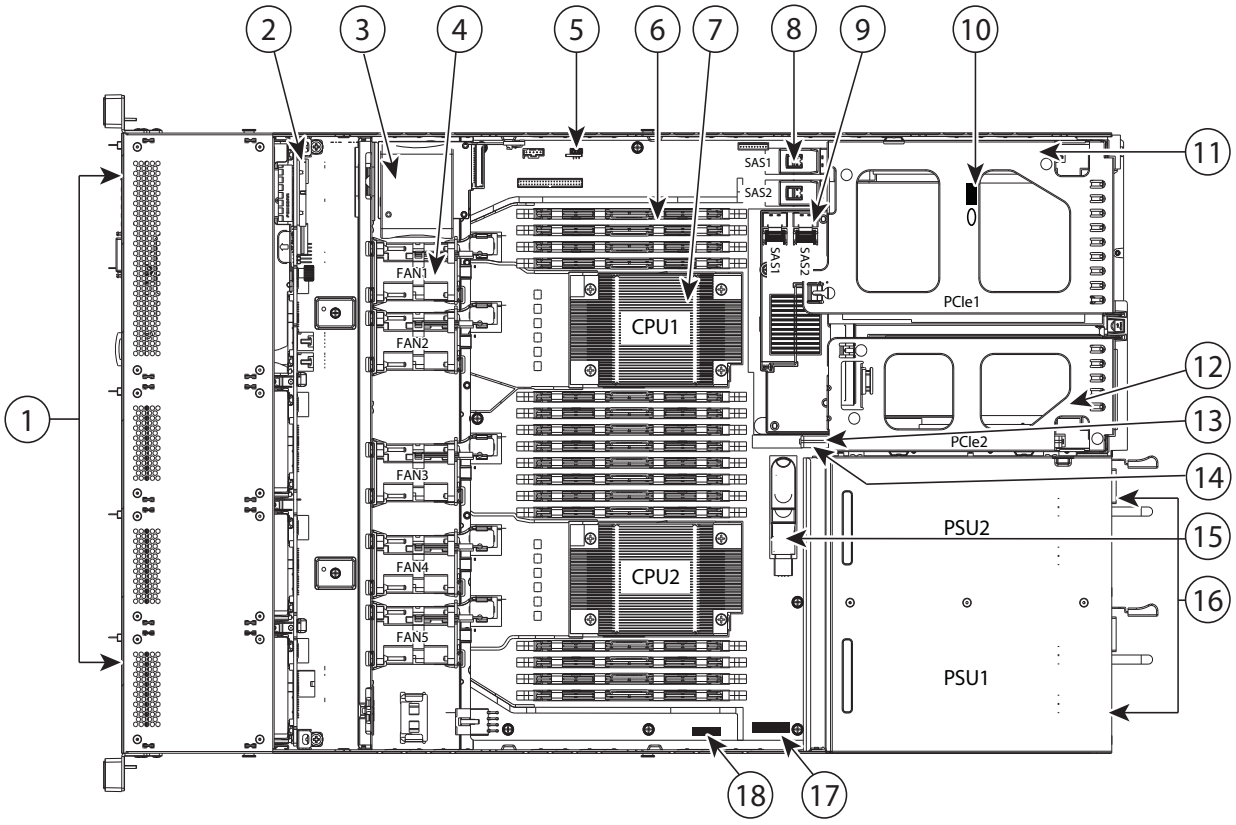
For more information about the PDU, see *PDUs, page 63*.

SUPPLEMENTAL MATERIAL

CHASSIS

An internal view of the C220 M3 chassis with the top cover removed is shown in *Figure 5*.

Figure 5 C220 M3 LFF With Top Cover Off



1	Drives (hot-swappable, accessed through front panel)	**10**	Trusted platform module socket on motherboard
2	Drive backplane	**11**	Standard-profile PCIe riser (PCIe slot 1)
3	SuperCap data cache power backup unit mounting location	**12**	Low-profile PCIe riser (PCIe slot 2)
4	Cooling fans (five)	**13**	Cisco Flexible Flash SD socket SD2 on PCIe riser 2
5	SCU upgrade ROM header (RAID key).	**14**	Cisco Flexible Flash SD socket SD1 on PCIe riser 2
6	DIMM slots on motherboard (16)	**15**	Internal USB port

7	CPUs and heatsinks (two)	**16**	Power supplies (two, hot-swappable access through rear panel)
8	Integrated RAID on motherboard, and mini-SAS connectors	**17**	RTC battery on motherboard
9	Mezzanine RAID card, mini-SAS connectors SAS1 and SAS2	**18**	Software RAID 5 header (RAID key).

CPUs and DIMMs

Physical Layout

Each CPU has four DIMM channels:

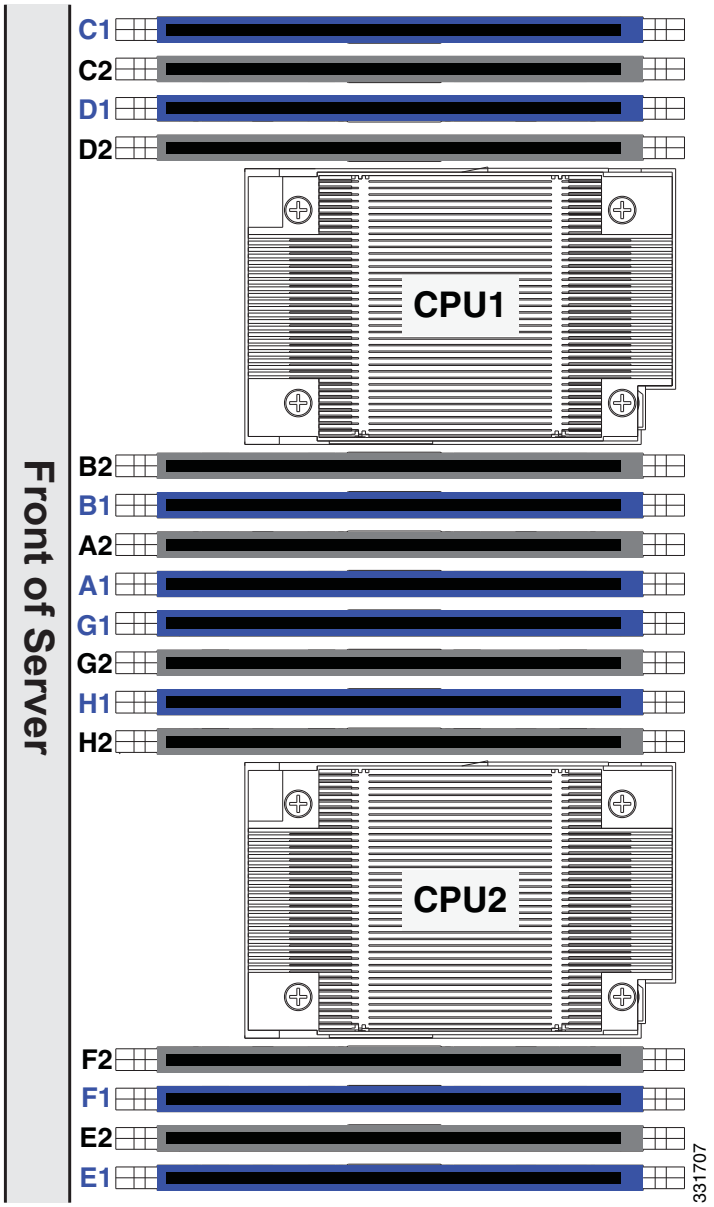
- CPU1 has channels A, B, C, and D
- CPU2 has channels E, F, G, and H

Each DIMM channel has two banks: bank 1 and bank 2. The blue-colored DIMM slots are for bank 1 and the black-colored are for bank 2.

As an example, DIMM slots A1, B1, C1, and D1 belong to bank 1, while A2, B2, C2, and D2 belong to bank 2.

Figure 6 shows how banks and channels are physically laid out on the motherboard. The DIMM slots on the right (channels A, B, C, and D) are associated with CPU1, while the DIMM slots on the left (channels E, F, G, and H) are associated with CPU2. The bank 1 (blue) DIMM slots are always located farther away from a CPU than the corresponding bank 2 (black) slots. Bank 1 slots (blue) are populated before bank 2 slots (black).

Figure 6 Physical Layout of CPU DIMM Channels and Banks



Memory Population Rules

When considering the memory configuration of your server, you should consider the following items:

- Each channel has two DIMM slots (for example, channel A = slots A1 and A2).
  - A channel can operate with one or two DIMMs installed.
  - If a channel has only one DIMM, populate slot 1 first (the blue slot).
- When both CPUs are installed, populate the DIMM slots of each CPU identically.
  - Fill blue slots in the channels first: A1, E1, B1, F1, C1, G1, D1, H1
  - Fill black slots in the channels second: A2, E2, B2, F2, C2, G2, D2, H2
- Any DIMM installed in a DIMM socket for which the CPU is absent is not recognized.
- Observe the DIMM mixing rules shown in *Table 30*

Table 30 DIMM Rules for C220 M3 Servers

DIMM Parameter	Mix Across a Single Bank?	Mix Across Multiple Bank?
DIMM Size		
RDIMM = 4, 8, or 16 GB	No—Must be same size in the same bank.	Yes—Different banks can use different DIMM sizes (as long as all DIMMs in a single bank use the same DIMM size).
LRDIMM = 32 GB	You cannot mix 32 GB LRDIMMs with any RDIMM	You cannot mix 32 GB LRDIMMs with any RDIMM
DIMM Speed		
1333 or 1600 MHz[1]	No—Must be same speed in the same bank.	Yes—but if DIMMs of mixed speed are used, the server will clock down to the lowest speed.
DIMM Type		
RDIMMs or LRDIMMs	You cannot mix LRDIMMs with RDIMMS	You cannot mix LRDIMMs with RDIMMS
32 GB DIMM Population	**1 DPC or 2 DPC**	
	DIMMs will run at 1333 MHz at either 1.35 V or 1.5 V	

Notes . . .

1. Only 1333- and 1600-MHz DIMMs are currently available for the C220 M3 server.

Recommended Memory Configuration

This section explains the recommended DIMM population order rules for the C220 M3 server.

- All DIMMs must be DDR3 DIMMs.
- Do not mix:
  - DIMMs with different sizes or clock rates in a bank
  - RDIMMs and LRDIMMs
  - ECC and non-ECC DIMMs
- There are blue and black DIMM slots. Populate blue slots first.
- When single- and dual-rank DIMMs are populated for 2DPC, always populate the dual-rank DIMM in the blue DIMM slot and the single-rank DIMM in the black DIMM slot.

Many memory configurations are possible. For best results, follow *Table 31* when populating DIMMs.

Table 31 Recommended Memory Configurations[1]

Total System Memory Size	CPU 1 DIMMs		CPU 2 DIMMs		DIMM Max Operating Speed (MHz)	Total DIMMs in the System
	Blue Slots Bank 1 (A1, B1, C1, D1)	Black Slots Bank 2 (A2, B2, C2, D2)	Blue Slots Bank 1 (E1, F1, G1, H1)	Black Slots Bank 2 (E2, F2, G2, H2)		
32 GB	4x4 GB	—	4x4 GB	—	1600	8
	2x8 GB	—	2x8 GB	—	1600	4
64 GB	4x4 GB	4x4 GB	4x4 GB	4x4 GB	1600	16
	4x8 GB	—	4x8 GB	—	1600	8
96 GB	4x8 GB	2x8 GB	4x8 GB	2x8 GB	1600	12
	3x16 GB	—	3x16 GB	—	1600	6
	4x8 GB	4x4 GB	4x8 GB	4x4 GB	1600	16
128 GB	4x8 GB	4x8 GB	4x8 GB	4x8 GB	1600	16
	4x16 GB	—	4x16 GB	—	1600	8
192 GB	4x16 GB	2x16 GB	4x16 GB	2x16 GB	1600	12
	4x16 GB	4x8 GB	4x16 GB	4x8 GB	1600	16
256 GB	4x16 GB	4x16 GB	4x16 GB	4x16 GB	1600	16
512 GB	4x32 GB	4x32 GB	4x32 GB	4x32 GB	1333[2]	16

Notes . . .

1. Rows marked in yellow indicate best performance.
2. Even though the specified maximum speed of 32 GB LRDIMMs is 1600 MHz, they run at a maximum speed of 1333 MHz in 2DPC configurations.

Supported DIMM Populations

The supported DIMM populations are listed in *Table 32*.

Table 32 Supported DIMM Configurations

CPU 1 DIMMs	Total DIMMs for CPU 1	CPU 1 Capacity	CPU 2 DIMMs	Total DIMMs for CPU 2	CPU 2 Capacity	Total Capacity for 2 CPUs
1 x 8 GB	1	8 GB	1 x 8 GB	1	8 GB	16 GB
1 x 16 GB	1	16 GB	1 x 16 GB	1	16 GB	32 GB
2 x 4 GB	2	8 GB	2 x 4 GB	2	8 GB	16 GB
4 x 4 GB	4	16 GB	4 x 4 GB	4	16 GB	32 GB
2 x 8 GB	2	16 GB	2 x 8 GB	2	16 GB	32 GB
6 x 4 GB	6	24 GB	6 x 4 GB	6	24 GB	48 GB
8 x 4 GB	8	32 GB	8 x 4 GB	8	32 GB	64 GB
4 x 8 GB	4	32 GB	4 x 8 GB	4	32 GB	64 GB
8 x 4 GB	8	32 GB	8 x 4 GB	8	32 GB	64 GB
1 x 32 GB	1	32 GB	1 x 32 GB	1	32 GB	64 GB
5 x 8 GB	5	40 GB	5 x 8 GB	5	40 GB	80 GB
3 x 16 GB	3	48 GB	3 x 16 GB	3	48 GB	96 GB
6 x 8 GB	6	48 GB	6 x 8 GB	6	48 GB	96 GB
4x8 GB + 4x4 GB	8	48 GB	4x8 GB + 4x4 GB	8	48 GB	96 GB
7 x 8 GB	7	56 GB	7 x 8 GB	7	56 GB	112 GB
4 x 16 GB	4	64 GB	4 x 16 GB	4	64 GB	128 GB
8 x 8 GB	8	64 GB	8 x 8 GB	8	64 GB	128 GB
2 x 32 GB	2	64 GB	2 x 32 GB	2	64 GB	128 GB
5 x 16	5	80 GB	5 x 16	5	80 GB	160 GB
4x16 GB + 4x4 GB	8	80 GB	4x16 GB + 4x4 GB	8	80 GB	160 GB
6 x 16 GB	6	96 GB	6 x 16 GB	6	96 GB	192 GB
4x8 GB + 4x16 GB	8	96 GB	4x8 GB + 4x16 GB	8	96 GB	192 GB
3 x 32 GB	3	96 GB	3 x 32 GB	3	96 GB	192 GB
7 x 16 GB	7	112 GB	7 x 16 GB	7	112 GB	224 GB
8 x 16 GB	8	128 GB	8 x 16 GB	8	128 GB	256 GB
4 x 32 GB	4	128 GB	4 x 32 GB	4	128 GB	256 GB
8 x 32 GB	8	256 GB	8 x 32 GB	8	256 GB	512 GB

Low-Voltage DIMM Considerations

The C220 M3 server can be ordered with dual-voltage (1.5/1.35 V) DIMMs only. Note the following considerations:

- Low-voltage DIMMs within the server must have the identical manufacturer, type, speed, and size.
- Low-voltage DIMMs and standard-voltage DIMMs can be mixed in the same server. Note that this causes the system BIOS to default to standard-voltage operation (Performance Mode). That is, the server cannot operate in Power Saving Mode unless all DIMMs are low-voltage DIMMs.
- CPUs that have a maximum memory frequency less than 1333 MHz support low-voltage DIMMs operating in Power Saving Mode only, and do not support Performance Mode.

RAID Summary

The C220 M3 LFF server has a 4-drive backplane.

- Intel RSTe, LSI ROM1, and LSI ROM15 embedded RAID upgrade options support up to 4 drives.
- Mezzanine card (UCSC-RAID-11-C220) supports up to 4 drives.
- Mezzanine card (UCSC-RAID-MZ-220) supports up to 4 drives.
- SAS 9266-8i and SAS 9266CV-8i PCIe cards support up to 4 drives.
- LSI MegaRAID SAS 9285CV-8e supports up to 8 external SAS ports (240 external drives).

NOTE: If you do not select a mezzanine card, a plug-in PCIe RAID card, or one of the embedded RAID upgrade options, you will have an embedded SATA-only RAID controller that supports up to four SATA-only drives (RAID 0, 1, 10)

See *Table 33* for a summary of the supported RAID configuration options.

Table 33 Supported RAID Configurations[1]

Server	# CPUs	Embedded RAID	Mezz RAID[2]	Internal PCIe RAID #1[3]	Internal PCIe RAID #2[4]	External PCIe RAID[5]	# Drives Supported	PCIe Slots[6]	
								1	2
C220 M3 LFF	1	**Enabled**	Not allowed[7]	Not allowed	Not allowed	Not allowed	4 internal	A	U
C220 M3 LFF	1	Not allowed	Not allowed	**Installed slot 1 (default)**	Not allowed	Card absent	4 internal	O	U
C220 M3 LFF	1	Not allowed	Not allowed	Card absent	Not allowed	**Installed slot 1**	0 internal 240 external	O	U
C220 M3 LFF	1	Not allowed	Not allowed	**Installed slot 1 (default)**	Not allowed	**Installed in slot 2**	0 internal 240 external	O	O
C220 M3 LFF	2	**Enabled**	Not allowed	Not allowed	Not allowed	Not allowed	4 internal	A	A
C220 M3 LFF	2	Not allowed	**Installed**	Not allowed	Not allowed	Card absent	4 internal	A	A
C220 M3 LFF	2	Not allowed	Not allowed	**Installed slot 2 (default)**	Not allowed	Card absent	4 internal	A	O
C220 M3 LFF	2	Not allowed	Card absent	Card absent	Not allowed	**Installed slot 1 or slot 2**	0 internal 240 external	A	A
C220 M3 LFF	2	Not allowed	**Installed**	Not allowed	Not allowed	**Installed slot 1 or slot 2**	4 internal 240 external	A	A

Table 33 Supported RAID Configurations[1] *(continued)*

Server	# CPUs	Embedded RAID	Mezz RAID[2]	Internal PCIe RAID #1[3]	Internal PCIe RAID #2[4]	External PCIe RAID[5]	# Drives Supported	PCIe Slots[6]	
								1	2
C220 M3 LFF	2	Not allowed	Not allowed	**Installed slot 2 (default)**	Not allowed	**Installed in slot 1**	4 internal 240 external	O	O

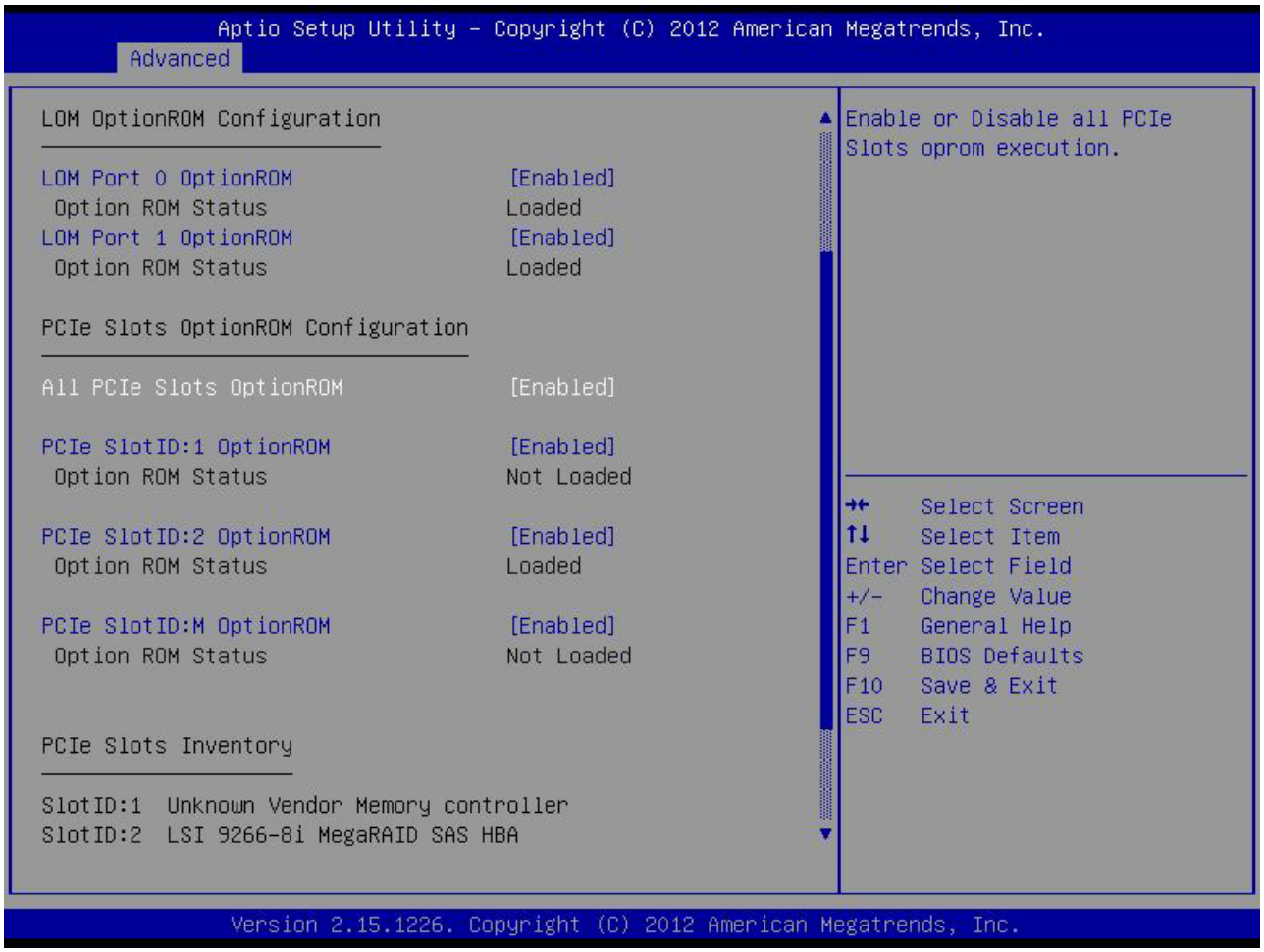
Notes . . .

1. You cannot mix RAID types. You can use either embedded RAID, mezzanine RAID, or PCIe RAID, but only one at a time.
2. Never disable OPROM for the mezzanine slot if the mezzanine card is present, or the system will not boot. If you remove the mezzanine card and disable its OPROM, you can boot from another bootable device (RAID card, embedded RAID, or from SAN via an HBA or CNA card). When you boot from a device, make sure its OPROM is enabled, it is in the proper boot sequence, and its BIOS is configured for a bootable device.
3. If you want to boot from a device other than the 9266-8i or 9266CV-8i MegaRAID PCIe cards, you can leave the cards installed. Just disable the OPROM for their slots, and the system will boot even with the cards installed.
4. Dual RAID controllers are not supported in this server
5. External RAID card is the 9285CV-8e. The 9285CV-e can be installed simultaneously with either one mezzanine RAID controller card or one internal RAID controller card (9266-8i or 9266CV-8i).
6. A = available slot, O = occupied slot, U = unsupported slot (slot 2 is not supported in 1-CPU systems)
7. The mezzanine slot is not supported in 1-CPU systems

RAID Option ROM (OPROM) Settings

The server contains an Option ROM (OPROM) for the PCIe slots. The server has a finite amount of option ROM with which it can boot up devices. Go into the BIOS and disable the OPROM on the PCIe slots not used for booting so that resources are available for the slots that are used for booting. An example OPROM BIOS screen is shown in *Figure 7*.

Figure 7 Example BIOS Screen for OPROM


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
LOM OptionROM Configuration
LOM Port 0 OptionROM [Enabled]
Option ROM Status Loaded
LOM Port 1 OptionROM [Enabled]
Option ROM Status Loaded
PCIe Slots OptionROM Configuration
All PCIe Slots OptionROM [Enabled]
PCIe SlotID:1 OptionROM [Enabled]
Option ROM Status Not Loaded
PCIe SlotID:2 OptionROM [Enabled]
Option ROM Status Loaded
PCIe SlotID:M OptionROM [Enabled]
Option ROM Status Not Loaded
PCIe Slots Inventory
SlotID:1 Unknown Vendor Memory controller
SlotID:2 LSI 9266-8i MegaRAID SAS HBA
Enable or Disable all PCIe Slots oprom execution.
→← Select Screen
↑↓ Select Item
Enter Select Field
+/- Change Value
F1 General Help
F9 BIOS Defaults
F10 Save & Exit
ESC Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

Upgrade and Servicing-Related Parts

This section lists the upgrade and servicing-related parts you may need during the life of your server. Some of these parts are configured with every server, and some may be ordered when needed or may be ordered and kept on hand as spares for future use. See *Table 34*.

Table 34 Upgrade and Servicing-related Parts for UCS C220 M3 LFF Server

Spare Product ID (PID)	Description
UCSC-BBLKD-L=	3.5-inch HDD Blanking Panel[1]
UCSC-CABLE3=	Spare SAS/SATA Cable (1) for C220 M3 LFF (3.5-in)
UCSC-PCIF-01H=	PCIe Low Profile blanking panel for UCS C-Series Server
UCSC-PCIF-01F=	PCIe Full Height blanking panel for UCS C-Series Server
UCSC-HS-C220M3=	Heat Sink for UCS C220 M3 Rack Server[1]
UCSC-AIRBAF-C220=	Air Baffle Replacement Kit for C220 M3 Server[1]
N20-MBLIBATT=	Replacement Lithium Battery for Server Motherboard (CR2032)[1]
UCS-RAID-BBU=	Battery Back-Up for 9266[2]
UCS-RAID-CV-SC=	LSI CacheVault Power Module 9266CV, 9265CV and 9285CV-8e[3]
UCSC-PSU-BLKP=	Power supply blanking panel/filler for C-Series Servers
UCSC-CMA1=	Reversible Cable Management Arm for C220 rack servers
UCSC-RAIL1=	Rail Kit for C220 rack servers
UCSC-RAIL1-I=	Inner rail spare for C220[4]
UCSC-SD-16G-C220=	16GB SD Card for C220 Servers[5]
UCS-SD-16G=	Blank SD Card for UCS servers[6]
UCS-USBFLSH-S-4GB=	4GB SLC Flash USB Drive (shorter) for all servers except C260
N20-BKVM=	KVM local IO cable for UCS servers console port[7]
UCS-CPU-EP-PNP=	Pick n place CPU tool set (for Intel E5 EP Socket R)[8]
UCS-CPU-GREASE2=	C220 and C240 CPU thermal grease syringe - needed for heatsink seal[8]
UCSX-HSCK=	UCS Processor Heat Sink Cleaning Kit (when replacing a CPU)[8]

Notes . . .

1. This part is included/configured with your UCS server (in some cases, as determined by the configuration of your server).

2. If your server contains an LSI MegaRAID SAS 9266-8i RAID controller card with battery backup (UCS-RAID-9266), the card contains a battery backup unit (UCS-RAID-BBU), which can be replaced. If your server contains an LSI MegaRAID SAS 9266-8i RAID controller card without a battery backup unit (UCS-RAID-9266NB), the card does not contain a battery backup unit (UCS-RAID-BBU); however, you can retrofit the card with a battery backup if desired. Note that you *cannot* retrofit a UCS-RAID-9266NB or UCS-RAID-9266 RAID card with an LSI Cachevault Power Module (also known as a Supercap).
3. You can order a replacement only for the RAID cards listed. You cannot retrofit a UCS-RAID-9266NB or UCS-RAID-9266 RAID card with an LSI Cachevault Power Module (also known as a Supercap)
4. The server is shipped with the inner rail attached to the chassis.
5. This SD card is preloaded with an image specific to the C220 server.
6. This SD card is blank. The required image for the C220 server can be downloaded to the card.
7. This part is included/configured with the server chassis.
8. This part is included with the purchase of an optional or spare CPU processor kit.

Drive Blanking Panels

A drive blanking panel (UCSC-BBLKD-L=) must be installed if you remove a disk drive from a UCS server. These panels are required to maintain system temperatures at safe operating levels, and to keep dust away from system components.

Adding an Additional CPU (with CPU heat sink)

All Cisco UCS two CPU socket-capable servers can be upgraded from having one to having two CPUs configured. You will need to order and install a heat sink when adding any additional CPU to a server. Instructions for installing the new CPU and heat sink can be found at the following link:

http://www.cisco.com/en/US/docs/unified_computing/ucs/c/hw/C220/install/replace.html#wp1233864

Motherboard Lithium Battery

You can order a replacement motherboard battery. Installation instructions are found at this link:

http://www.cisco.com/en/US/docs/unified_computing/ucs/c/hw/C220/install/replace.html#wp1235772

CPU Removal and Installation (“pick n place”) Tool Set

The Pick n Place tool set includes two tools:

- Pick and pull cap tool - used to pull off the plastic protective cap covering an empty CPU socket and to remove or lift a CPU processor without touching it
- Pick and place tool - used to install a CPU in its socket without damage. Must be used each time a CPU is installed in a UCS “M3” server.

Instructions for using this tool set are found at the following link:

http://www.cisco.com/en/US/docs/unified_computing/ucs/c/hw/C220/install/replace.html#wp1233864

NOTE: When you purchase a spare CPU, the Pick n Place Toolkit is included.

Thermal Grease (with syringe applicator) for CPU to Heatsink Seal

Thermal grease must be applied to the top of the CPU where it comes in contact with the heat sink. Instructions for applying thermal grease are found at:

http://www.cisco.com/en/US/docs/unified_computing/ucs/c/hw/C220/install/replace.html#wp1233864

CAUTION: Use only the thermal grease specified for this server (UCS-CPU-GREASE2=). Thermal grease for other systems may have different thermal conductivity properties and may cause overheating if used in the C220 M3 server. DO NOT use thermal grease available for purchase at any commercial electronics store. If these instructions are not followed, the CPU may overheat and be destroyed.

NOTE: When you purchase a spare CPU, the thermal grease with syringe applicator is included.

Air Baffle Replacement Kit

Air baffles are designed to direct airflow through the server to maintain server temperature at a safe operating level. These baffles must always remain installed during server operation. The Air Baffle Replacement Kit includes the air baffles needed for one UCS C220 M3 server.

CPU Heat Sink Cleaning Kit

The cleaning kit is used to remove the existing thermal compound from the bottom of the heat sink during a CPU replacement process. Instructions for cleaning are found at the following link:

http://www.cisco.com/en/US/docs/unified_computing/ucs/c/hw/C220/install/replace.html#wp1233864

NOTE: When you purchase a spare CPU, the CPU cleaning kit is included.

RACKS

The Cisco R42610 rack (see *Figure 8*) is certified for Cisco UCS installation at customer sites and is suitable for the following equipment:

- Cisco UCS B-Series servers and fabric interconnects
- Cisco UCS C-Series and select Nexus switches

The rack is compatible with hardware designed for EIA-standard 19-inch racks. Rack specifications are listed in *Table 35*.

Table 35 Cisco R42610 Rack Specifications

Parameter	Standard Rack	Expansion Rack
Dimensions (H x W x D)	78.74 x 24 x 43.38 in. (2000 x 610 x 1102 mm)	78.74 x 23.58 x 43.38 in. (2000 x 599 x 1102 mm)
Dimensions (H x W x D) with packaging	89 x 33 x 47 in. (2261 x 838 x 1194 mm)	89 x 33 x 47 in. (2261 x 838 x 1194 mm)
Distance from front mounting rail to rear mounting rail	29.2 in (741 mm)	29.2 in (741 mm)
Weight	299.83 lb (136 kg)	231. 49 lb (105 kg)
Weight with packaging	354 lb (161 kg)	284 lb (129 kg)
Side panels included	Yes	No
Equipment mounting capacity	42RU	42RU
Static load capacity	2100 lb (954 kg)	2100 lb (954 kg)
Dynamic load capacity	Not applicable	Not applicable

NOTE: The AC input connector is an IEC 320 C-14 15 A/250 VAC power inlet.

Figure 8 Cisco R42610 Rack

Front view - door closed

Front view - door open

Front view - door removed

PDUs

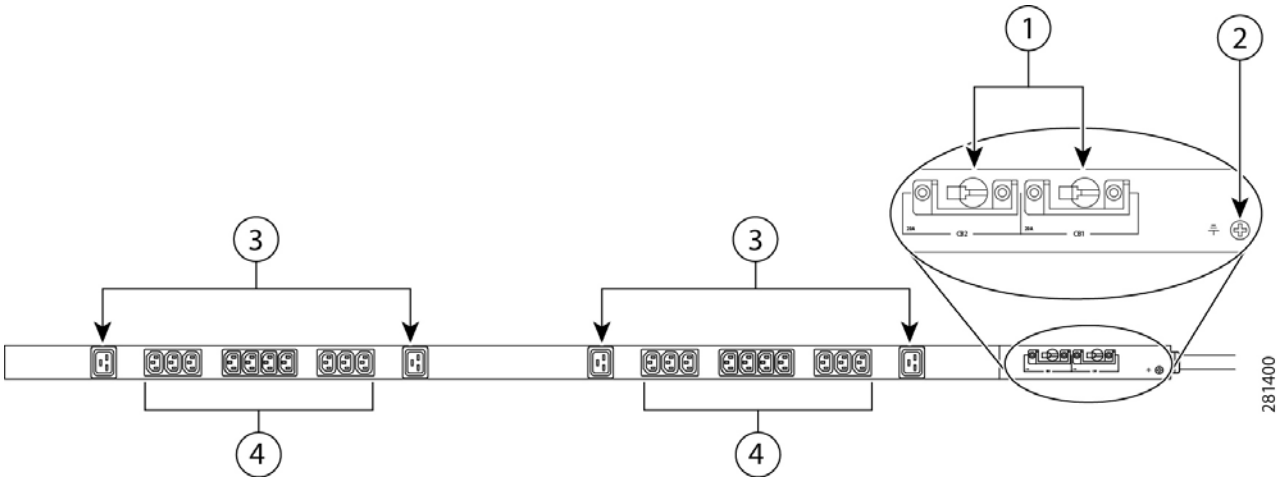
Cisco RP Series Power Distribution Units (PDUs) offer power distribution with branch circuit protection.

Cisco RP Series PDU models distribute power to up to 24 outlets. The architecture organizes power distribution, simplifies cable management, and enables you to move, add, and change rack equipment without an electrician.

With a Cisco RP Series PDU in the rack, you can replace up to two dozen input power cords with just one. The fixed input cord connects to the power source from overhead or under-floor distribution. Your IT equipment is then powered by PDU outlets in the rack using short, easy-to-manage power cords.

The C-series severs accept the zero-rack-unit (0RU) PDU. See *Figure 9*).

Figure 9 Zero Rack Unit PDU (PID = RP208-30-2P-U-2)



1	Breakers	**3**	C19 plugs
2	Ground connection	**4**	C13 plugs

Cisco RP Series PDU models provide two 20-ampere (A) circuit breakers for groups of receptacles. The effects of a tripped circuit are limited to a receptacle group. Simply press a button to reset that circuit.

KVM CABLE

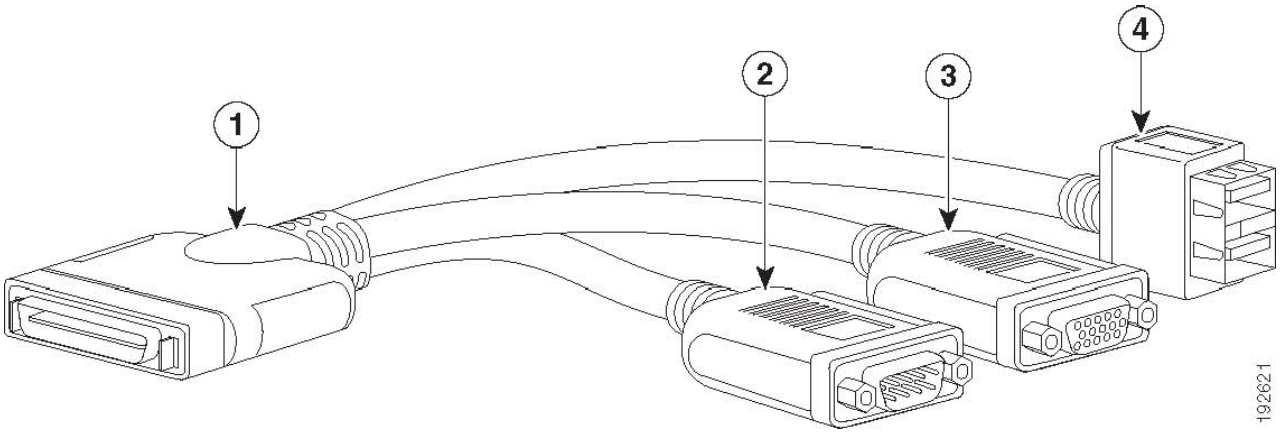
The KVM cable provides a connection into the server, providing a DB9 serial connector, a VGA connector for a monitor, and dual USB ports for a keyboard and mouse. With this cable, you can create a direct connection to the operating system and the BIOS running on the server.

The KVM cable ordering information is listed in *Table 36*.

Table 36 KVM Cable

Product ID (PID)	PID Description
N20-BKVM	KVM cable for B-Series Blade Server console port

Figure 10 KVM Cable

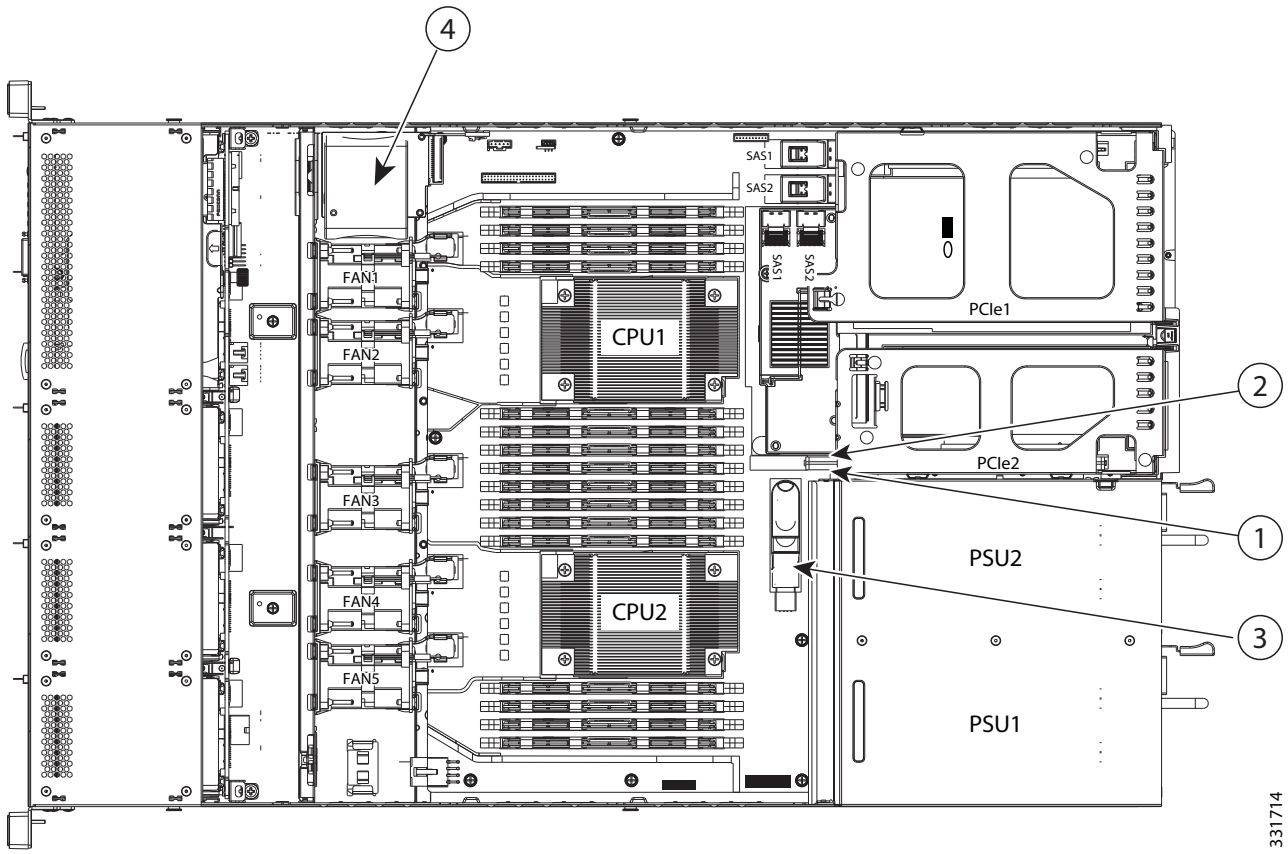


1	Connector (to server front panel)	**3**	VGA connector (for a monitor)
2	DB-9 serial connector	**4**	Two-port USB connector (for a mouse and keyboard)

Motherboard USB and SD Ports, and RAID Card Backup Location

The C220 M3 LFF motherboard has a general-purpose USB socket, and two SD sockets as shown in *Figure 11*. The mounting location for the RAID SuperCap data cache power backup module is also shown.

Figure 11 Motherboard USB and SD Ports and RAID Card Backup Location



1	SD1 socket	**3**	USB connector
2	SD2 socket	**4**	SuperCap module mounting location

TECHNICAL SPECIFICATIONS

Dimensions and Weight

Table 37 UCS C220 M3 LFF Dimensions and Weight

Parameter	Value
Height	1.7 in. (4.32 cm)
Width	16.92 in.(43.0 cm)
Depth	29.7 in. (75.5 cm)
Front Clearance	3 in. (76 mm)
Side Clearance	1 in. (25 mm)
Rear Clearance	6 in. (152 mm)
Weight	
Maximum (4 HDDs, 2 CPUs, 16 DIMMs, 2 power supplies)	37.1 lbs (16.8 kg)
Minimum (1 HDD, 1 CPU, 1 DIMM, 1 power supply)	28.5 lbs (12.9 kg)
Bare (0 HDD, 0 CPU, 0 DIMM, 1 power supply)	23.4 lbs (10.6 kg)

Power Specifications

The general power specifications for the C220 M3 LFF server 450 W power supply are listed in *Table 38*.

Table 38 UCS C220 M3 LFF 450 W Power Supply Specifications

Description	Specification
AC input voltage	90 to 264 VAC self-ranging, 100 to 120 VAC nominal 200 to 240 VAC nominal
AC input frequency	Range: 47 to 63 Hz (single phase, 50 to 60 Hz nominal)
Maximum AC input current	6 A maximum @ 100 VAC 3 A maximum @ 208 VAC
Maximum AC inrush current	9 A peak @ 35° C, 208 VAC
Maximum output power for the power supply	450 W
Power supply output voltage	Main power: 12 VDC Standby power: 12 VDC

Table 38 UCS C220 M3 LFF 450 W Power Supply Specifications *(continued)*

Description	Specification
Power supply efficiency	CSCI Platinum

NOTE: AC input connector is an IEC 320 C-14 15A/250VAC power inlet.

The general power specifications for the C220 M3 LFF server 650 W power supply are listed in *Table 38*.

Table 39 UCS C220 M3 LFF 650 W Power Supply Specifications

Description	Specification
AC input voltage	90 to 264 VAC self-ranging, 100 to 120 VAC nominal 200 to 240 VAC nominal
AC input frequency	Range: 47 to 63 Hz (single phase, 50 to 60 Hz nominal)
Maximum AC input current	7.6 A maximum @ 100 VAC 3.65 A maximum @ 208 VAC
Maximum AC inrush current	11 A peak @ 35° C, 208 VAC
Maximum output power for the power supply	650 W
Power supply output voltage	Main power: 12 VDC Standby power: 12 VDC
Power supply efficiency	CSCI Platinum

NOTE: AC input connector is an IEC 320 C-14 15A/250VAC power inlet.

For configuration-specific power specifications, use the Cisco UCS Power Calculator at this URL:

https://express.salire.com/Go/Cisco/Cisco-UCS-Power-Calculator.aspx

Environmental Specifications

The power specifications for the C220 M3 server are listed in *Table 40*.

Table 40 UCS C220 M3 Environmental Specifications

Parameter	Minimum
Temperature operating	41 to 104° F (5 to 40° C) derate the maximum temperature by 1°C per every 305m of altitude above sea level
Temperature nonoperating	–40 to 149°F (–40 to 65°C)
Humidity (RH) nonoperating, non-condensing	10 to 90%
Altitude operating	0 to 3,000 m (0 to 10,000 ft.)
Altitude nonoperating	0 to 12,192 m (0 to 40,000 ft.)
Sound Power level, Measure A-weighted per ISO7779 LWAd (Bels) Operation at 73°F (23°C)	5.4
Sound Pressure level, Measure A-weighted per ISO7779 LpAm (dBA) Operation at 73°F (23°C)	37

Compliance Requirements

The regulatory compliance requirements for C-Series servers are listed in *Table 41*.

Table 41 UCS C-Series Regulatory Compliance Requirements

Parameter	Description
Regulatory Compliance	Products should comply with CE Markings per directives 2004/108/EC and 2006/95/EC
Safety	UL 60950-1 Second Edition CAN/CSA-C22.2 No. 60950-1 Second Edition EN 60950-1 Second Edition IEC 60950-1 Second Edition AS/NZS 60950-1 GB4943 2001
EMC - Emissions	47CFR Part 15 (CFR 47) Class A AS/NZS CISPR22 Class A CISPR22 Class A EN55022 Class A ICES003 Class A VCCI Class A EN61000-3-2 EN61000-3-3 KN22 Class A CNS13438 Class A
EMC - Immunity	EN55024 CISPR24 EN300386 KN24

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